

COMPUTERWORLD

On the World Wide Web at www.computerworld.com



Stock Exchange:

GOING, GOING, GONE

**\$35M in-house development effort fails;
Reuters to the rescue with virtual trading**

By Frank Hayes

After a four-year, \$35 million internal development fiasco, the Toronto Stock Exchange finally purchased the pieces it needs to launch a virtual trading floor.

Last week's deal with Reuters Information Services Ltd. to design trading workstations is part of the exchange's new plan to buy, instead of build, its all-electronic trading floor.

"We're a stock exchange, not a software factory," said Brian Harding, senior vice president of information systems and trading services

at the exchange. "Our floor-closure project ran into technical problems, and enough time has gone by that we can now buy the technology instead of building it ourselves."

Some brokers who deal with the exchange were more blunt: "It was a \$35 million fiasco," said AnneMarie Stock Exchange, page 16

Explorer beta gains ground on Navigator

By Kim S. Nash

Microsoft Corp. last week released a second beta version of its Internet Explorer World Wide Web browser that some users say closes in on the performance and functionality of Netscape's Navigator.

Surpassing Netscape Communications Corp.'s star power on the Internet will be tough, users and analysts said. Netscape dominates the browser arena, with market share estimated at 70% to 85%.

Still, the browser king may have been caught napping. Microsoft's Internet Explorer 3.0 Beta 2 is often faster at downloading Microsoft, page 16

NT 4.0 beats clock

Microsoft to ship ahead of schedule; users cite minor bugs

By Laura Didio

Never known for getting its products out the door on time, Microsoft Corp. confirmed that it will formally unveil Windows NT 4.0 next Wednesday, a month earlier than expected.

Although users of the pre-release version said they haven't

encountered major flaws, some expressed concern that Microsoft may be shipping the product before addressing minor bugs and documentation woes.

Operating systems

Mike Nash, Microsoft's group product manager for Windows

NT, confirmed the July 31 release date but emphatically denied that Microsoft would ship

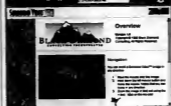
NT 4.0 before getting all the bugs out. "We absolutely will not compromise the quality of NT 4.0," he said.

But users said current pre-release versions are still beset by several minor bugs and are missing key documentation.

Some users speculated that Microsoft was rushing NT 4.0 to beat Novell, Inc.'s next release NT 4.0, page 109

Components turn up Web wattage

By Sharon Gaudin



Black Diamond Consulting offers 3-D images that rotate to give visitors a 360-degree view

The World Wide Web could look dramatically different a year from now, as developers ramp up their use of software components to add animation, live information feeds and interactivity.

The use of self-contained, reusable software chunks should supercharge the already highly graphical Web, making a cruise through the Internet more like a ride through a CD-ROM game, developers and analysts said.

And the ride is picking up speed because companies can no longer differentiate them-

Web sites, page 109

WHAT'S INSIDE

Reviews in this issue:

- OpenDoc should be considered by any developer who needs to create reusable components. See Software, page 54.
- New notebooks, although pricey, challenge desktop machines on virtually every front. See Servers & PCs, page 39.
- Four users tell why they like OS/2 Warp Server Network and systems management tool. See The Enterprise Network, page 60.

Browsers

Microsoft's Internet Explorer 3.0 Beta 2 is often faster at downloading

Microsoft, page 16

'net excess vexes IS



36% of IS managers polled by Computerworld have diverted resources to Internet projects under management pressure. For complete results, see www.computerworld.com

By Joseph Maglitta

Many technologists know and dread Airtel Magazine Syndrome. That's when a business executive reads about the latest wonder-widget in an in-flight publication, returns to the office and de-

mands to know, "Why aren't we doing more with this?"

Bad news, IS. When it comes to the Internet and intranets, the syndrome is everywhere, from *BusinessWeek* to *Entrepreneur* to *Time*. And it's causing pain to many technology groups.

Hype headaches, page 61

1-800-877-7678 ***** 5-DIGIT 48183
48183038800036 JUL 96 001 009556226 0000
UNIVERSITY MICROFILMS INT
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48103-1500

Editor's Note

Web worship

There's an insidious new virus sweeping the computer industry, and I'm afraid I've caught it. It's Web Surfing Envy. The major symptom of WSE is a glowing, anxious conviction that everyone else is surfing more often and more competently than you are.

One Computerworld editor has perfected a Web surfing routine that takes him to 10 critical, fascinating, professionally enriching sites in less than a half-hour. I stand in awe of this kind of efficiency. What discipline this demonstrates over the 25 million glittering sites on the Web, which are apparently going to get even more alluring in the next year (see Sharon Gaudin's story on page 1).

CompuServe got hit last week by this very same bug, I would guess. All those subscribers who bailed out of the online service probably looked around and said, "Hey! Why am I hanging with these pathetic dweebs when all the cool people are surfing the Web?" Point, click—we're gone.

Another symptom of the WSE virus is memory loss. I keep forgetting the different passwords I made up to register at those fascinating sites. The *New York Times* online still sends me virulent questions about why I never confirmed my registration password, which naturally I forgot. This is probably why so many people in cyber-space use aliases. WSE can lead to professional embarrassment.

Another telltale symptom, general crankiness with your IS department about network speed and bandwidth. It's so small wonder there's a backlash against Internet hype building among IS professionals, as our stories (pages 1 and 12) point out this week.

Once your senior business managers get WSE, there's no reasoning with them. But as one IS manager lamented, "You find out how much work it is to keep a Web page updated and ask yourself: Have we issued a better dog license thanks to the 'net'?"

Once the media hype finally simmers down, what will happen in all those caves cursed by Web Surfing Envy? As one of your IS brethren puts it, "Our 15 minutes of fame will be followed by three years of darkness."

Margaret Johnson, Executive Editor
Internet, margjohn@computerworld.com

The 5th Wave by Rich Tennant



"DAD REMINDS ME - I INSTALLED WINDOWS 95 ON MY 386 LAST WEEK."

News

Sybase cleans house

By Dan Richtman

Sybase, last week took a series of dramatic steps to reverse its ailing fortunes. The company appointed a new CEO, cut its workforce by 10% and eliminated four products.

Marshall E. Kortman was promoted to president and CEO, and co-founder and former CEO Mark B. Hoffman became chairman of the board.

Kortman, former CEO of PowerSoft Corp., a subsidiary of Sybase, is now responsible for formulating strategy and running the company.

The changes followed Sybase's \$6.9 million loss, for the quarter ended June 30. Kortman said Sybase will focus on its core strengths.

"We invested distributed, heterogeneous computing, but then we let ourselves get off our focus on that. We now need to take responsibility to reduce its complexity and cost. We still believe in it passionately," he said.

Users reacted positively. "Mark Hoffman is out as Sybase CEO



Mark Hoffman is out as Sybase CEO

Hoffman is a very good guy, but he's not a marketer," said Cory Isaacson, president of CompuFlex International, Inc., an end user and consultant in Chatsworth, Calif.

"And Kortman is a dyed-in-the-wool, gregarious marketing guy. I think it's a great move."

Sybase cut between 600 and 700 employees from its staff, reducing its head count by about 10%, and cut four minor product lines.

News Shorts

Gupta settles books

Capit, Inc. in Menlo Park, Calif., last week said it will spend \$15 million to



help settle a shareholder class action lawsuit over financial statements the company made in 1993 and 1994. Disagreements over those statements cost the company its auditor, Arthur Andersen LLP, last October. Gupta's new auditor, Price Waterhouse, has given the Gupta's books a clean bill of health—but that bill includes a \$4 million loss for last year.

OptiPlex price drops

Dell Computer Corp. in Austin, Texas, last week dropped the price of its OptiPlex line of corporate PCs by up to 14%, making it the third time since January that the company has lowered the line's prices.

Lotus migration tools

Lotus Development Corp. is shipping migration tools to help its CC-Mail users move to Notes. The tools are free at Lotus's World Wide Web site (www.lotus.com). Administrators can use the tools to move directories, messages, attachments, mailing lists and folders to the Notes server and convert CC-Mail bulletin boards to Notes databases.

Sun ships Internet pack

Sun Microsystems, Inc., last week made the Internet Access Plus-Pack available at its World Wide Web site (www.sun.com). The pack is a suite of software for chatting, browsing, accessing au-

dio and video and otherwise using the 'net. The \$99 bundle runs only on Sun's Solaris and includes software for running Java applets.

Point, click, ship

FedEx Corp. in Memphis has released InterNetShip, software designed to let FedEx customers arrange to send packages via the delivery company's World Wide Web site (www.fedex.com). Users can fill in shipping forms online, generate a package tracking number and schedule a driver pickup.

C/NET sells Web app

C/NET: The Computer Network world will announce that it has sold the Prism server software it uses to run its sites, including the online computer industry newspaper (www.cnet.com). The new owner, Vignette Corp. in Austin, Texas, plans to include the software in its World Wide Web management suite, which will be released in October.

Microsoft posts code

Microsoft Corp. will put binary and source reference implementations of the scripting engines for Visual Basic Script and JScript on its World Wide Web site (www.microsoft.com). The reference material can be downloaded for free a few weeks after Internet Explorer's official release, which is expected next month.

Novell, McGill link deal

Novell, Inc. and McGill Systems, Inc., are scheduled to announce a deal to integrate

McGill's HostExplorer terminal emulation technology with Novell's LAN WorkPlace Pro for Windows 95 and Windows NT. The technology will give WorkPlace Pro users access to Unix servers and workstations and IBM-compatible mainframes.

McAfee adds apps

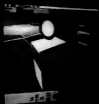
McAfee Associates, Inc. last week acquired a 32-bit remote windowing technology for Windows NT and Windows 95 applications from Interactive Distributed Systems in Austria. The Remote Desktop 32 software lets network administrators remotely administer 32-bit Windows NT and Windows 95 systems.

Process names CEO

Process Software Corp., has appointed Dean Goode to replace company founder Phil Denner as president and CEO. Goode previously was president of PSDI, Inc., an asset management software maker he helped take public last year. Denner will remain as chairman.

SHORT TAKES IBM this week will announce long-delayed RS/6000 multiprocessors based on the PowerPC 604 chip, as expected (CW, July 8). ... Boole & Bahage, Inc. and IBM last week announced a \$10 million pact to expand an agreement that would let IBM continue to use Boole's systems management technology in its CICSplex System Manager product through March 1999.

Total Enterprise Management



Now, there's an open and independent solution to all of your enterprise management challenges.

Finally, there's a single answer to all of your enterprise management challenges.

New CA-Unicenter TNG

The first open and independent software solution that covers all of your existing systems, networks, databases, and applications. All your hardware. All your software. All your IT resources.

CA-Unicenter TNG makes it easy. With a stunning, real world interface that uses 3-D graphics to let you actually fly through your enterprise without leaving your desk. And innovative Business Process Views that let you view IT resources from a business perspective. It's the new way to transform IT information into intelligence.

**Call 1-800-654-6118 For A Free TNG Video
And To Register For A Seminar.
Or Visit Us At <http://www.cai.com>**

Call today to learn more about the single, integrated solution for End-to-End Management. It's the technology of tomorrow — that's available today.

**COMPUTER
ASSOCIATES**
The World's Most Powerful Software

New CA- Unicenter TNG

© 1999 CA Computer Associates International, Inc. All rights reserved. CA, the CA logo, and Unicenter are trademarks of CA Computer Associates International, Inc. in the U.S. and other countries. TNG is a trademark of CA Computer Associates International, Inc. in the U.S. and other countries. All other trademarks are the property of their respective owners.

News

NEWS

- 64-bit: Who'll bite?**
Users are expected to wait years before making a wide-spread transition to 64-bit applications.
 - New service levels**
Network managers can now choose a happy medium between T1 and T3 service levels.
 - Year 2000 in the sky**
Before year 2000 hits, a timing change problem might strike satellite systems.
 - Help wanted**
A few good CIOs are hard to find, Uncle Sam learns.
 - Taking a Web "time-out"**
Users aren't as enamored with the Internet as Wall Street is.
 - R/3 outsourcing**
Analysts foresee a booming business for R/3 outsourcers.
 - Eschewing Exchange's groupware**
Users are overlooking the groupware features in Microsoft's Exchange Server in favor of E-mail.
 - Lawson's new software**
Lawson Software this week will announce a major release of Internet-ready financial and human resources software.
- OPINION**
- Web servers, Part 1...**
Microsoft's not dead in the Internet waters quite yet, Paul Gillin says.
 - ...and Part 2**
IS managers have decided it's a two-horse race for Web server supremacy, says research guru David C. Neschella.



Choice Cuts

Master of your destiny:
An advanced college degree could be the key to moving your career further, faster. See Careers, page 86.

Doing their own thing: *Thinking of starting your own company? Three former IS pros share their entrepreneurial experiences. See Managing, Page 77*

Technical Sections

SERVERS & PCs

- Hard-ly forgotten**
Forget network storage — hard disk sales are rising quickly.
- Notebook reviews**
Although they're pricey, three new notebooks challenge desktop machines in almost every category.
- SOFTWARE**
- Batching it**
A pact between IBM and BMC Software may make processing mainframe batch jobs quicker.
- OpenDoc review**
Developers who need to write reusable components should check out OpenDoc.

THE ENTERPRISE NETWORK

- Interoperable tools**
A pending standard promises to make proprietary network

management tools interoperable.

- Review: OS/2 Warp Server**
Users say why they like it.

THE INTERNET

- Monitoring the 'net**
Internet monitoring tools promise webmasters more control.
- Is collapse imminent?**
Predictions of Internet collapse shouldn't be ignored, Charles Babcock says.
- CORPORATE STRATEGIES**
- No ticket, no waiting**
American and other airlines are big on systems that support ticketless travel.
- Pentagon tool**
The Pentagon's analysis tool is finding civilian and commercial users.

Features

MANAGING

- Entrepreneurs**
IS pros who strike out on their own.

IN DEPTH

- Internet hype**
Great expectations put the squeeze on IS.

CAREERS

- Moving ahead by degree**
An advanced degree is good for your career.

MARKETPLACE

- Network design**
There's a new generation of network design tools.

FINANCE & INVESTING

- The 'net effect**
How do you evaluate an Internet IPO?

This week in

11



COMPUTERWORLD

win in the Computing Trade category for its Aug. 28, 1996, coverage of the Windows 95 launch.

Folio:
MANAGEMENT

1996 Annual Editorial
Excellence Awards

Etc.

Company Index	107
Editorial/Letters	36
How to contact CW	107
Inside Lines	110
Stock Ticker	106

Oracle: #1 in OLAP, too.

In technology, market share and every other important measure, Oracle is the leader, among open database vendors. And now that is true in OLAP too.

Features	Oracle	Sybase	Informix
Relational and Multidimensional Data	Express Server	No	No
OLAP Development Tools	Express Objects	No	No
OLAP Applications	Sales Analyzer Financial Analyzer	No	No
End-User OLAP Analysis Tools	Express Analyzer	No	Yes
Number of Databases Supported Directly	8	0	1



The World's First
All-Purpose Server

On-Line Analytical Processing (OLAP) allows you to get real business benefit out of your corporate data. Oracle today offers the most comprehensive OLAP capabilities of any vendor. Critical features like what-if analysis, modeling and forecasting, intuitive data navigation, exception reporting and data mining. All with transparent access to data in Oracle7 and other leading databases. Integrated or best-of-breed components, your choice.

For the most complete OLAP solution, call Oracle 1-800-633-1071, ext. 8131. Or find us on the Web at <http://www.oracle.com>

ORACLE
Enabling the Information Age™

©1998 Oracle Corporation. Oracle is a registered trademark, and Oracle® and Enabling the Information Age are trademarks of Oracle Corporation. All rights reserved.
Market share data from Business Intelligence, Ltd. All other company product names are trademarks of their respective owners.

Users in no hurry for 64-bit system migration

By Craig Stedman

Unix vendors keep talking that 64-bit talk. But it will likely be years before most users feel the need to walk the walk.

Keeping the patter going is Hewlett-Packard Co., which today will detail plans for adding 64-bit capabilities to its HP-UX operating system by the middle of next year. IBM will follow suit next week with a road map for upgrading its AIX software to 64-bit status by late next year.

The promise of 64-bit operating systems lies in further speed improvements, increased application scaling and flexibility because of added support for larger memory capacities and file sizes. That is especially attractive to very large database users.

The leading Unix vendors — HP, IBM and Sun Microsystems, Inc., which already sell on a 64-bit transition plan earlier this year — are being pushed into action by Digital Equipment Corp.'s success at the high end with its 64-bit

TurboLaser systems.

Other than IBM, the major Unix vendors ship 64-bit hardware, which should boost performance even if it only runs 32-bit applications. But only Digital and Silicon Graphics, Inc. ship complete 64-bit systems at this time.

David Poole, director of enterprise servers at Digital, said about 30% of the 2,000 high-end TurboLaser systems that it sold in the past 15 months had enough memory to take advantage of the 64-bit capabilities. Digital expected the

Double-talk

- Support for more memory and larger files and file systems than 32-bit operating systems
- Flat address space for building databases without tiered indexes

Target applications for 64-bit operating systems:

- Large data warehouses with complex querying and analysis capabilities
- Enterprise applications with many thousands of users
- World Wide Web search engines and other multimedia uses
- Technical computing that involves large simulations

figure to be closer to 10%, he said. "I think it's starting to trickle in everywhere," Poole said.

But despite Digital's gains and the resulting flurry of vendor activity, some users and analysts maintain that filtering 64-bit technology into the mainstream will be a long process.

Longevity

George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn., predicted a gestation period of up to five years for Unix systems and even longer for Windows NT, which is expected to catch on at low-end and midrange Unix sales.

David Pensak, head of computer science research at Du Pont Co. in Wilmington, Del., said he can see increased file sizes that HP, IBM and Sun will support as the first step on their 64-bit road maps.

More than that, 32-bit sys-

tems should meet his needs for another two to three years, he said. "We just haven't found them to be a significant constraint yet."

"In a very limited subset of our applications, 64-bit [software] could help," said Don Baune, manager of computer operations, at the University of Utah's radiology department in Salt Lake City. Medical images that the radiology department runs on Sun servers will eventually hit the limits of 32-bit technology, according to Baune.

But Sun's plan to turn Solaris into a 64-bit operating system within 18 months "is about as far as we really would need it," Baune said. "And I'm not really sure how much of an impact it's going to have on our day-to-day operations."

X Windows vendors are adopting Web browsers. See page 49.

Support will come bit by bit

Evolution, not revolution. That's the spin HP and IBM are expected to put on their 64-bit makeover plans for their Unix operating systems. HP will support larger file sizes in its HP-UX release due in August. The company will follow in the middle of next year with a full 64-bit implementation to be called HP-UX 11. Users will be able to run their 32-bit applications on HP-UX 11 without having to recompile code, HP officials said.

In 1998 or later, HP will switch to a merged Unix that it

is developing with SCO, Inc. Dan Berlinger, HP-UX product manager, said HP is "being deliberately fustier at that end of the spectrum" because it has to wait for Intel Corp. to ship its promised Merced chip. That chip will replace the Pentium processors now used in HP's workstations and servers.

IBM is expected next week to announce plans for reaching full 64-bit status with its AIX software in the second half of next year. It also has promised to ship 64-bit Unix hardware in the second half. IBM and Sun

—like HP— are inching toward 64-bit support by enabling their operating systems to handle larger files.

But users have to do special coding to take advantage of that, and existing applications need to be modified to work with the larger files in a 32-bit environment, said Greg Weiss, an analyst at D. H. Brown Associates.

"Most [customers] will probably just wait until the full 64-bit operating systems come out," Weiss said.

—Craig Stedman

Web targeted to unify management

By Patrick Dryden

Key desktop and network vendors last week proposed a standard that could unify management of diverse client/server components via the World Wide Web.

Highly-equipped administrators could someday avoid having to shift among several different network, system and application tools by using a middleware standard dubbed Web-Based Enterprise Management (WBEM).

That is the future pitched by BMC Software, Inc., Cisco Systems, Inc., Compaq Computer Corp., Intel Corp. and Microsoft Corp. Initial backers include Bose & Hubbard, Inc., Cabletron Systems, Inc., Dell Computer Corp. and Symantec Corp.

"This could be the glue that will unite all the diverse management standards into one universal ap-

proach," said John Feldmeier, vice president at network monitoring vendor Technically Elite, Inc. in San Jose, Calif.

"We'd like to find a way to pull all our tools together on one platform, and the intranet is the place to do it," added Mons Ellingren, leader of the network management engineering group at Arvin Public Service Co. in Phoenix.

But users expressed some skepticism because so many vendors and standards organizations are involved. Also, similar efforts to unify management objects have been hindered, then buried.

"So far, this is just a lot of talk. I wouldn't tell anyone to hold off pursuing other solutions," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

The success of the venture hinges on how well WBEM can be

made to work with the wealth of existing Simple Network Management Protocol (SNMP) devices, said Jeff Case, one of SNMP's creators and president of SNMP Research International, Inc. in

Knoxville, Tenn.

Adaptation is possible, but not easy. "As we say down on the farm, you can make a mouse play the piano if you apply enough voltage," Case said.

Ambitious acronyms

WBEM is a standards effort that seeks to let administrators use any Web browser to manage networks, systems and applications.

The goal: Define a universal manager so that browsers and analysts can rely on the Web's Hypertext Transfer Protocol (HTTP) to reach existing management reporting mechanisms.

Those mechanisms include SNMP used by networking gear and the Desktop Management Interface used by new PCs and servers.

Two multivendor management technologies are

proposed to adopt three established standards to Web access. HyperMedia Management Schema (HMMS) is a set of data structures designed to categorize and show associations among manageable objects throughout a network. HyperMedia Management Protocol (HMMP) calls that schema to run over HTTP.

HMMS will be controlled as an open standard by the Desktop Management Task Force, with HMMP guided by the Internet Engineering Task Force.

—Patrick Dryden

Year 2000 syndrome strikes again

By Stewart Deck

A story used to circulate among Navy fighter pilots regarding their planes' Global Positioning System (GPS) navigation systems. It was rumored that if a pilot crossed the equator in a plane outfitted with a GPS device — ka-wham! — the plane would flip upside down.

Top Gun theatrics aside, the GPS system doesn't exactly work that way, but an upcoming satellite timing change could throw those navigation systems for a loop.

It sounds a bit like a year 2000 problem, but this one will reveal itself 132 days before the end of the millennium, on Aug. 22, 1999. The GPS system is a time-based network of 24 satellites in synchronous orbit. Each satellite continuously transmits time-tagged

data bits over broadband radio frequencies to tell where it is at precisely what time.

On Earth, GPS receivers listen to four or more satellites at once and compute the time intervals between when signals were sent and when they were received to calculate the exact distance between the satellites and the receiver. That lets each receiver tell its exact latitude and longitude coordinates.

Who needs to know latitude and longitude? A lot of people, actually. Trucking lines, including Craig Transport in Perrysburg, Ohio, and Umbro Trucking in Eagle Grove, Iowa, use GPS systems to track fleets of trucks on the road. Rental car companies Avis, Inc. and the Hertz Corp. have outfitted vehicles with GPS devices that tell drivers how to

navigate in cities across the U.S.

Although he hadn't heard of the problem, Will Strauss, president of Forward Concepts, a market research firm in Tempe, Ariz., said that if it is true, "something of that import would have effects far beyond what people know" because of the pervasiveness of GPS receiver applications. The satellite timing mechanism isn't your everyday clock. It measures time in one-week blocks of seconds. Instead of "Monday morning, 9 a.m.," it will say, "Week X, 118,800 seconds."

The possible wrench in the works is in that pesky Week X. The satellites were taught that Week 1 began on Jan. 6, 1980. Unfortunately, their clocks could not handle 1,024 weeks in their versions of the year field, so they will all roll back to Week 1 on Aug. 22, 1999. On that date, the satellites will begin transmitting time data as Week 1. What should be August and September 1999 could look like January 1980 to an unknowing receiver.

How GPS works

- 1 Each GPS satellite has an atomic clock that continuously broadcasts the time and its position.
- 2 On Earth, a GPS receiver listens to four or more satellites at once.
- 3 The receiver computes the time intervals between when signals were sent and when they were received.
- 4 The receiver calculates the exact distance between the satellites and the receiver.
- 5 The receiver tells the user its exact latitude and longitude.

Each Magellan receiver, for instance, has its date of manufacture encoded in its software.

When the receiver tells a receiver it is 1980, the receiver will self-adjust to the correct time.

Hertz isn't too concerned at this point, either. In October, the company will roll out 8,000 supposed rental cars with Navstar GPS navigation systems built by Rockwell International Corp. "Our customers love it, and we believe this is the technology of the future," said Lauren Kelly, public affairs manager at the Park Ridge, N.J., company.

Hopewell, they will still love it in August 1999.

Robert Scheier, senior editor, management, contributed to this story.

The Pentagon goes public with its re-engineering tool. See page 72.

Microsoft's Visual J++ beta

By Justin Hibbard

Microsoft Corp. last week began distributing via its World Wide Web site a free beta-test version of Visual J++, a Java development tool aimed largely at Visual C++ developers who stray into the Java camp.

Formerly code-named Jakarta, the product sports the same interface as Microsoft's Visual C++ development tool. That gives Visual C++ users a smooth migration path to Java programming while keeping them in the Microsoft fold.

Beta testers familiar with Visual C++ said the J++ environment feels like home.

"We had been using C++ so it was an easy shift to using J++ since it has that similar feel," said Mike Mullen, a developer at Bulletpoint Corp., a software firm in San Jose, Calif. "The compiler is quite fast. I'd say it's five to 10 times faster than other environ-

IBM mounts attack against HP 3000

Will offer trade-in deals, access to third-party experts

By Jakumar Vijayan and Michael Goldberg

IBM is aiming a pitch at the heart of Hewlett-Packard Co.'s HP 3000 community.

Bolstered by what it perceives as growing unease among HP 3000 users over the future of their investments, IBM this week will launch a marketing campaign aimed at luring users and software developers into the AS/400 fold.

IBM's effort will include a mailing to about 2,000 HP users, invitations to teleconferences and migration strategy sessions with third-party experts and trade-in deals, said Tony Madden, an IBM AS/400 technology executive.

Analysts said they seriously doubted that the campaign would trigger mass defections. But the IBM effort, which will come two weeks before the HP World user show in Anaheim, Calif., underscores the industry perception that HP needs to pay more attention to its longtime HP 3000 customers.

The HP 3000 is one of HP's oldest and most popular midrange computers. Recently, however, some users expressed concern over what they consider to be HP's ambivalence toward continued applications and operating system support (CWI, April 22).

"The HP 3000 is something of a cult product. But time has passed,

while IBM claims the AS/400 is a good alternative to the HP 3000 ...

■ Supports 64-bit hardware and software

■ Has 25,000 applications — all Internet enabled

■ Supports Windows, OS/2, Unix and Macintosh clients

■ HP says it is better to stay with the HP 3000

■ HP will continue to meet application needs if its installed base as long as there is user demand

■ HP will continue to provide operating systems and hardware enhancements, including 64-bit support

■ HP will support increasing interoperability between Windows NT, Unix and other HP platforms

and that community has been semiabandoned by HP," said Dave Andrews, managing partner at D.H. Andrews Group, Inc., a consultancy in Cheshire, Conn. "HP ... [is] focusing their attention on Unix," he said.

However, IBM's alternative, the AS/400 — also a proprietary system with 1970s minicomputer roots — features some of the same ease-of-use strengths for business system administrators, Andrews said.

Sat Mayall, director of information systems at CMS Global Packaging Systems in Treviso, Pa., said his company converted to the AS/400 two years ago. "We felt that HP support for us was

very negligible" in terms of applications availability for the HP 3000, he said.

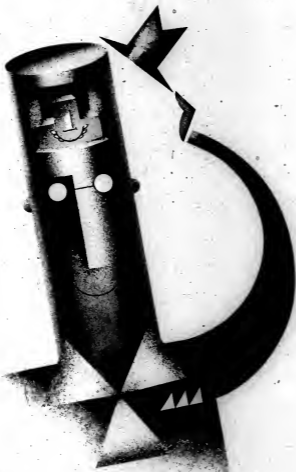
The HP 3000 "is damn good hardware, but we just didn't have enough software or programmers to keep up with it," said Norio Nishiguchi, IS director of Cameron County in Brownsville, Texas.

The county, which started migrating applications of a HP 3000 to AS/400 about three years ago, now buys third-party applications. It needs instead of having to develop them in-house like it used to.

Still, mass migrations to IBM are extremely unlikely, said Ron Seybold, editor of "The 3000 NewsWire," a newsletter based in Austin, Texas.

WINNERS!

THE BEST DATABASE PERFORMANCE IS NOW WITH ADABAS D AND DIGITAL.



Recently, 1,700 benchmark users achieved an average response time of 1.44 seconds, setting a new record for the SAP R/3 Sales & Distribution (SD) benchmark. A full twelve percent faster than the previous record!

Just as we expected, the 64 bit power of Digital's VLM64 technology and SOFTWARE AG's highly scalable ADABAS D gave the fastest results ever. All of which means ADABAS D is the fastest, most efficient database system.

If you want to find out more about this WINNING combination, visit our website on the Internet.

ADABAS D
Personal Edition for free



Phone 1-800-4ADABAS, Ext. 1122
1-800-423-2227, Ext. 1122
1-800-DIGITAL, press 4



<http://www.softwareag.com/adabasd>
<http://www.digital.com>

ACK
Copyright 1994 Software AG. All references herein are the registered or unregistered trademarks of SAP AG. Copyright 1994 SAP America Inc. Bugati, Alpha and VLM64 are registered trademarks of Digital Equipment Corp. Results listed are certified SAP R/3 Sales and Distribution benchmark as of May 1, 1994.

digital™

software AG

Job hunting? Government seeks CIOs

By Gary H. Anthes
WASHINGTON

Within a little more than two weeks, 23 federal agencies, by law, must appoint chief information officers. But most won't meet that deadline, and observers say it will be

months before the government has qualified CIOs onboard—if ever.

Bureaucratic inertia is partly to blame, but the real stumbling block is low government pay scales, according to government and industry officials.

"It's a million-dollar, General Motors CIO

type of job," said Hank Philcox of his former post as CIO at the Internal Revenue Service.

The government CIOs will be paid \$115,600 per year, or a third to a fifth of what their counterparts in industry earn.

"The pay, plus the difficulty of a job of



The GSA's Joe Thompson: Most agency CIOs lack qualifications

that type, plus all the political stuff you have to put up with, is not attractive to the private sector," said Philcox, who for the past year has been CIO at DynCorp in Reston, Va.

Only a few agencies, including the U.S. General Services Administration (GSA) and the departments of State and Defense, have appointed CIOs as mandated by the 1996 Information Technology Management Reform Act. The act, which takes effect Aug. 8, aims to make agencies more accountable for, and effective in, their \$25 billion annual information systems activities.

A few other agencies, such as the IRS and NASA, have permanent or interim CIOs. But most lack the qualifications specified in the law, said Joe Thompson, CIO at the GSA. He predicted it would be next year before a full cadre of CIOs is in place.

President Clinton last week created a CIOs Council charged with recommending federal IS management policy, procedures and standards; sharing ideas to improve IS management; and improving the hiring and training of IS managers.

It won't be easy

"We think it will be difficult to recruit the CIOs," conceded Renato DiPentima, chairman of the CIO Task Force of the Industry Advisory Council (IAC), which advises the government on information technology issues.

Qualifications will be a problem. A report by the IAC defined the ideal candidate as "a somewhat rare creature: a politically astute, bureaucratically maze-bright, business-oriented individual."

But sponsors of the government CIO concept predicted they will find civic-minded people willing to take big pay cuts for the opportunity to serve the public.

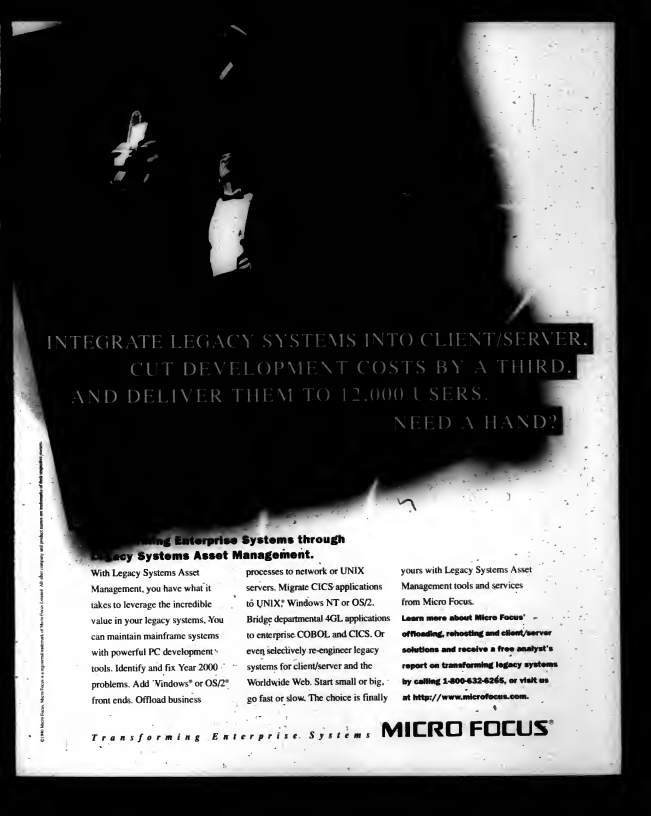
Indeed, such people do exist. Veteran CIO Larnie Rodgers, now a private consultant, took a 50% cut in salary when she moved from a senior IS management position at Citibank to become CIO of the city of Phoenix in 1991. "It was a wonderful opportunity to really make a difference and to learn, I loved it," she said.

Some have questioned whether the CIOs will improve things and point out that six years after major agencies created the post of chief financial officer, many are still unable to produce reliable financial statements [CW, June 17].



Today's business challenges require a different kind of muscle

visix



INTEGRATE LEGACY SYSTEMS INTO CLIENT/SERVER.
CUT DEVELOPMENT COSTS BY A THIRD.
AND DELIVER THEM TO 12,000 USERS.
NEED A HAND?

**Transforming Enterprise Systems through
Legacy Systems Asset Management.**

With Legacy Systems Asset Management, you have what it takes to leverage the incredible value in your legacy systems. You can maintain mainframe systems with powerful PC development tools. Identify and fix Year 2000 problems. Add Windows® or OS/2® front ends. Offload business

processes to network or UNIX servers. Migrate CICS applications to UNIX, Windows NT or OS/2. Bridge departmental 4GL applications to enterprise COBOL and CICS. Or even selectively re-engineer legacy systems for client/server and the Worldwide Web. Start small or big, go fast or slow. The choice is finally

yours with Legacy Systems Asset Management tools and services from Micro Focus.

Learn more about Micro Focus' offloading, rehosting and client/server solutions and receive a free analyst's report on transforming legacy systems by calling 1-800-632-6265, or visit us at <http://www.microfocus.com>.

Transforming Enterprise Systems **MICRO FOCUS®**

Users are strolling on to Web

By Tim Ouellette and Randy Weston

As Wall Street last week coiled its love affair with the Internet by stockpiling infused technology stocks, users said they aren't surprised by the reality check.

Despite the relentless hype (see story, page 1) and fast pace of change on the Internet, many users have been slow to apply World Wide Web technology to business.

"I am not that enamored with it [the Web]," said Al Leiser, MIS director for Pinellas County in Clearwater, Fla. "You find out how much work it is to keep a Web page updated and safe yourself. Have we issued a better dog license thanks to the Internet?"

Leiser has a point. TeleChoice, Inc., a consultancy in Verona, N.J., estimates that firms can spend between \$90,000 and \$2 million to create and maintain a Web site and another \$450,000 just to keep a midsize Web site updated.

That can be just the tip of the

iceberg. V. I. Shiva, president of Web page developer Millennium Productions, Inc., said his Cambridge, Mass., firm has seen an increase in clients who weren't happy with their first stab at a Web site but are giving it another go because they know it is a necessity.

It isn't just the site that has to be updated. Rich Jaroslovsky, managing editor at *The Wall Street Journal's* Interactive Edition, said his business model also is highly subject to change.

"We're trying out to adopt a bunch of new technologies until we're sure a large number of our readers actually want them," he said, referring to plug-ins, video clips and other special graphics effects.

Join the crowd

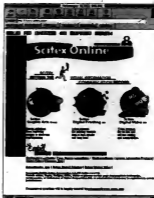
Many user companies realize they need an Internet presence to keep up with the Joneses.

"I'm in the process of going. All right, fine. I may have to do something out here." But I'm

doing it very slowly," said John L. Thomas, vice president of information technology at Market Knowledge, Inc. in Lombard, Ill.

"We're definitely stepping back now and saying, How can we fit this [Web technology] into our business plan, specifically job matching," said Mimi Garrity Denman, vice president of marketing at Asia Personnel Services, Inc. "And when it came to business applications, we wanted to take it slow and steady."

That might not be the best news for Web developers. Especially because many of the Web software firms hit hard by the Wall Street sell-off probably won't bounce back quickly — particularly smaller firms, which depend on that money to develop products, said Mi-



Companies such as Scitex rely on software from tried-and-true firms like Oracle for their Web development.

chael Murphy, editor of the "California Technology Stock Letter."

But users can depend on more established firms that are still per-

forming in the market. "We're an Oracle shop. Oracle doesn't have the latest and greatest Web technology, but they have what we need right now, and we're pretty sure they're going to be around in the future," said Ethan Simmons, operations manager at Scitex America Corp. in Bedford, Mass. And users are generally positive about Web-based technology and its potential to help their business.

"I'm very optimistic" about the future of the Internet, Deamus said. "If we didn't have a Web site, [Scitex] wouldn't have paid attention to us. Trying to keep up with the technology is a challenge, but you have to do it. ... If you are to succeed in the future, you have to be committed to supporting the Internet."

Oracle's database plan for 'net may not suit everyone

By Dan Richman
SAN FRANCISCO

Oracle Corp.'s approach to intranets and the Internet might be right for some types of businesses but not for sites that aren't heavily database-oriented, analysts said last week.

The Redwood City, Calif., vendor last week laid out plans to link its database technology to the Internet. By this fall, users will be able to perform electronic mail functions, group collaboration, online transaction processing (OLTP) and decision support on the Internet, company officials said.

Oracle executives demonstrated a full range of business activities over an intranet, including querying a database and placing a wholesale order for goods.

Oracle's most significant claim centered on using the Internet for complex, critical transactions,

such as transferring a bank customer's funds in a single session by debiting one account and crediting another.

"It's very exciting to think about users at PCs, and maybe eventually at [automatic teller ma-



Using live data from an Oracle database, Oracle's Express Web Analyzer offers 3-D visualization to help users see patterns in data.

chines, arranging loans *à la carte* interacting with an entirely through the Internet," said Charles D. Walker, vice president of systems at Wells Fargo Bank in Walnut Creek, Calif.

Richard F. Walsh, a systems manager at Honeywell, Inc. in

Phoenix, said, "OLTP would be a more interactive alternative, a nice complement to the [electronic data interchange] that's already in use here."

But Ira Macheraky, a senior analyst at Giga Information Group in Santa Clara, Calif., urged caution.

"Essential to Oracle's vision is that directory services, E-mail messages, documents, even HTML pages belong in a database. Could there be a [database management system] for sale here somewhere?" he asked rhetorically.

Macheraky added, "Database-centricism doesn't necessarily fit well in the diverse environment of intranets and the Internet."

He said Netscape Communications Corp.'s offerings, although not as capable for database-intensive sites, are more flexible and open. Microsoft Corp., too, offers several strong Internet and intranet applications, he said, although they are available only for the Windows operating systems.

Database-intensive businesses such as retailers or wholesalers

would be ideal candidates for Oracle's offerings, but a service provider, such as a medical office, might not, analysts said.

Jeon S. Bouman, a research manager at International Data Corp. in Mountain View, Calif., said, "Oracle is playing to its natural strength here — databases, and that may be a limiting factor to some. But on the other hand, it also means that Oracle has gone a lot further than Microsoft has in terms of completeness of its offering."

Products to be released by year's end include the following:

- **Version 3.0 of Oracle's Web Server**, the first version to exploit the transactional capabilities built in to the Oracle7 relational DBMS. It will cost \$249.

Shoot 'em up

With its newly announced WebServer 3.0, which links database engines to the Internet and intranets, Oracle has given us improved cartridges.

Cartridges do for WebServer what Illustris' cartridges do for Illustris/Informatica and what the more generically named plug-ins do for Netscape's Webscape server. They extend its

functionality by attaching to the heart of the WebServer, the Web Request Broker.

Cartridges can alter the creation of applications or be applications themselves. Unlike the cartridges now shipping with WebServer 2.0, those shipping with 3.0 will be able to process transactions (see adjoining story).

— Dan Richman

- **Version 4.0 of InterOffice collaboration software**, which gives users Internet-based or client/server E-mail, scheduling, directory services, document management and World Wide Web publishing capabilities. It will cost \$500 per user.
- **WebCharts**, a real-time graphical display module for use with Express Server.
- **Version 1.3A of Designely 2000**, a tool used to generate transactional code and automatically convert client/server applications into Internet applications. It will cost \$3,995.
- **Version 1.3.2 of Developer/2000**, a fourth-generation language that allows for publishing reports on the Web. It will cost \$3,995.

Distributed objects, multiple platforms and Internet extensions. Let them take your applications to

There is no single more powerful client/server-application development tool than PowerBuilder® 5.0.

Because PowerBuilder 5.0 lets you distribute objects on multiple platforms.

So you benefit from both increased performance and easier, centralized application management.

And you can also bring seamless data access and presentation capabilities to your Web site with new Internet controls and PowerBuilder Window-plug-ins.



Plus, the PowerBuilder 5.0 applications you build can be deployed practically anywhere, including Windows® 95, Windows 3.1, NT/Intel®, NT/Alpha®, Macintosh® and UNIX®.

PowerBuilder 5.0 is available in Desktop, Professional and Enterprise editions. To experi-

ence it at one of our seminars, or get more information, call us at 1-800-395-3525.

And watch your applications take off.

 **Powersoft.**

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

800-395-3525

Compaq adds management features to PCs

By Bob Francis

PC market leader Compaq Computer Corp. this week will redefining its corporate desktop by adding desktop management as a standard feature.

The Houston company is dropping the ProLinx moniker and trimming its corporate desktop offerings from four to three product families: Desktop 2000, 4000 and 6000.

Pricing for the newly designed PC lines, the company's first since April of last year, begins at \$1,100 for the Pentium 100-MHz

Desktop 2000, which has 8M bytes of RAM and an 800M-byte hard disk.

The top end is a Desktop 6000 with a 300-MHz Pentium Pro chip, 32M bytes of RAM and a 2G-byte hard disk.

"These prices are pretty aggressive," said Martin Reynolds, an analyst at Datquest, a research firm in San Jose, Calif.

"Compaq" got their manufacturing in line, and they plan to compete with Dell and Hewlett-Packard on price. These prices are probably a bit better than with the previous systems," he said.

Users seemed pleased with the offerings. "They've kept up with the technology, and they seem pretty well-priced," said a PC buyer at a New York bank.

Positive feedback

The addition of systems management technology to the line is a good idea, said Erik Goldoff, an IS manager at the national Centers for Disease Control and Prevention in Atlanta.

"That's a major cost factor over the long haul," he said. The systems management fea-

tures include inventory, fault and security components.

Compaq has also added systems management features to SCSI disk drives, which were previously available only on low-end disk drives.

The Desktop will be available with Windows 3.1/Windows 95 dual-load feature or Windows NT. Compaq officials said they are awaiting a version of Windows NT that will allow them to offer a triple-load feature.

While Compaq has maintained its lead as the top U.S. PC suppli-

er, it continues to face challenges from Dell, HP and IBM in the corporate market, Reynolds said.

Last week, for instance, Dell, in Austin, Texas, dropped prices on its corporate desktop line by as much as 14%. The company cited lower component costs as the reason for the cuts. But analysts said they also suspect Dell wants to maintain a slight price advantage over its cross-state rival Compaq.

Reviewing laptops? We are, too. See page 39.

Compaq Desktops get integrated systems management			
MODEL	PROCESSOR	ADDED FEATURES	PRICE
Desktop 2000	100-MHz Pentium to 300-MHz Pentium Pro	An CD-ROM optional	\$1,100 to \$3,600
Desktop 4000	130-MHz Pentium to 200-MHz Pentium Pro	Integrated network card	\$1,600 to \$3,500
Desktop 6000	160-MHz Pentium to 300-MHz Pentium Pro	Integrated network card, An CD-ROM storage options	\$2,600 to \$5,000

Netscape, Sun and Spyglass post profits

Key industry vendors last week weighed in with strong financial results.

Sun Microsystems, Inc. closed its fourth fiscal quarter with \$2 billion in revenue, a 22% increase in revenue of \$1.6 billion recorded during the same quarter last year.

Net income, however, fell from \$128 million in the fourth quarter last year to \$122 million in the same period this year. But Sun said it took charges of about \$64 million related to its acquisitions of Integrated Micro Products, Inc. and Lighthouse Design Ltd.

World Wide Web browser rivals Netscape Communications Corp. and Spyglass, Inc. also reported surging levels of revenue and net income.

Netscape reported \$75 million in sales for its fiscal second quarter, more than five times the \$14 million it posted in the same period of a year ago. Profits for the quarter topped \$906,000, compared with a \$2.8 million loss last year.

Spyglass had \$6 million in sales for the quarter, up from \$2.7 million, with profits at \$862,000 — more than double the \$356,000 that the Naperville, Ill., vendor posted in the same quarter last year.

Truice holds for operating systems vendors

By Mitch Wagner
COLORADO SPRINGS

Developments from last week's Prognosis conference on the future of the network operating system are like a good news/bad news joke.

The good news is that, after years of warning over proprietary technology, vendors are coming together to discuss ways of making those technologies interoperable. But the bad news, experts said, is that it could take years for products to materialize.

"Last year at this time, vendors were facing in different directions. This year they're all turned the same way. We have our faces in the sun now, and it feels good. But there's a long road we have to walk down," said analyst Jamie Lewis, president of The Burton Group in Midvale, Utah, which hosted "Prognosis: The Future of the NOS."

Although there is finally agreement in principle, directory technology is extremely complicated.

Vendors still need to agree on means of security and authentication. Also needed are means of synchronizing information among directories of information "ownership" of information.

Different directions

At issue in the negotiations is directory services, an essential network technology that keeps track of all the resources on a network, including users, software and

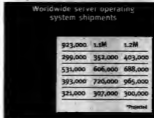
hardware components.

Each vendor has its own implementation. As a result, users at big sites need to maintain multiple complicated and redundant directories.

Those can include one for each distributed technology, perhaps one for the network itself, another for Novell, Inc. NetWare, others for messaging applications

including groupware and electronic mail — another for multimedia access and still another for the Internet.

That's too complicated for users. "I need a directory and security services that I can plug onto the network, and they'll run," said Jay Wiley, an information technol-



ogist at Bechtel Group, Inc. in San Francisco. "And they'd better not cut in on my users' productivity because, in that case, they'll cut into profits, and I'll be out of a job."

The turning point in the directory coming-together process came in the spring, when more

than 40 major network vendors — including Microsoft Corp., IBM, Novell and Netscape Communications Corp. — announced support for the Lightweight Directory Access Protocol (LDAP).

Now the vendors have a standardized means for directory products to communicate with one another.

But LDAP doesn't provide standardized data formats for directories. Still required is a so-called meta-directory, a single system that would coordinate the information in the different directories scattered over a user's distributed system, according to Craig Burton, a principal at The Burton Group.

Can't we all just get along?

Microsoft, Novell, IBM and others vendors last week provided some glimpses of products designed to improve interoperability among multidivisional network operating systems.

• **Zoomit** from In Toronto displayed its Tiny Zoomit, preliminary versions of technology designed to help synchronize network directories from multi-

ple vendors. The product will be released by year's end. Pricing hasn't been determined yet.

• **IBM** said it plans early next year to deliver a single sign-on service. The service will solve a security and access problem now faced by users at big user installations, who have to log on separately to a network and to individual applications such as databases

and groupware.

• **Microsoft** said it plans to include support for LDAP in its next major release of Windows NT, code-named Cairo.

• **Novell** announced plans to port Novell Directory Services, the directory built in to its NetWare Version 4.x operating system, to NT and leading Unix platforms within 12 months.

—Mark Wagner

Midsize firms boost SAP R/3 outsourcers

Demand for SAP expertise leads firms to farm out core

By Julia King

As a growing number of midsize companies implement SAP AG's R/3 client/server software, analysts predict a booming business for third-party vendors that offer SAP outsourcing services.

"Companies want to outsource SAP for the same reason they outsource everything else — it's not their core competency," said Rita Terdiman, an analyst at Gartner Group, Inc. in Stamford, Conn.

Given the continuing high demand for experienced SAP expertise, farming out the care and feeding of R/3 systems and networks "definitely seems to be a trend," said Tim Bourgeois, an analyst at International Data Corp. in Framingham, Mass.

On the leading edge of this trend are companies such as Rubbermaid Corp.'s Playground Equipment Division in Wooster, Ohio, and GATX Corp., a \$300 million financial services company in San Francisco.

Once Rubbermaid's SAP implementation is completed next year, its R/3 applications will run on hardware in Raleigh, N.C., that is owned and maintained by IBM's Integrated Systems Solutions Corp. under a 10-year, multi-million-dollar contract.

Among other things, outsourcing SAP at Rubbermaid will help ease the company's long-standing information systems recruitment headaches. "We're not very close to a major metropolitan area, so we've had problems getting IS professionals on a long-term basis," said Lucius Hoffa, senior vice president of IS at Rubbermaid.

Value added

"Where we saw real value with IBM was in the recruitment and maintenance of staff," Hoffa said.

GATX's R/3 applications will run on a Hewlett-Packard Co. 9000 computer at a data center owned by Affiliated Computer Systems, Inc. (ACSI) in Dallas. ACSI is an outsourcing company that specializes in running R/3 systems.

With an in-house IS staff of 16, GATX runs "an extremely lean IS organization," said Michael Cromar, chief financial officer and SAP project manager at GATX.

"The biggest concern for us was having resources consumed by tasks that didn't add value to our business," he said.

Under its contract with ACSI, GATX retains responsibility for configuring R/3 applications to its business requirements, and ACSI handles system administration. The latter includes installing new versions and

upgrades to R/3 as they are released. GATX also has outsourced its legacy computer operations to ACSI.

In the past nine months, SAP has aggressively marketed its R/3 software to small

and midsize companies. Like GATX, many of those companies have small IS staffs and little client/server systems expertise — two gaps that outsourcers can fill.

Filling those gaps — rather than cutting costs — seems to be the main factor driving outsourcing, at least among early users.

"We did not look at outsourcing from a cost-savings point of view but rather as a way to bring new technology in to the business," Hoffa said.

New tools ease R/3 implementations.
See page 69.

EUROPEAN ART COMES TO THE SCREEN, WITHOUT THOSE ANNOYING SUBTITLES.



From the continent that gave us museums and luxury automobiles — come their combined spiritual equivalent: Nokia monitors. Nokia is already a household name land cafe and office, name tag throughout Europe. And now Nokia monitors are quickly winning the hearts and eyes of Americans too.

The European passion for beauty is expressed in the magnificent clarity of the screens and the soothing refresh rates. The Nordic obsession with technical perfection is embodied in the variety and sensitivity of Nokia's controls and components. And the continental love for life and good health is evident in the

extraordinary TCO-compliant emissions controls Nokia integrated. Add to this the sheer elegance of the looking and Plug 'n Play connectivity under Windows 95. A Nokia monitor is more than electronics. It's art. But, it's an avant-garde that's quite easy to appreciate. Especially when it makes those darn life subtitles so much easier for you to read.

For more information or a demonstration in your office call 1.800.BY NOKIA. Dept. Code: N21



Here is the technical detail of the monitor in the ad. All other information is for general information only.



NOKIA
MONITORS

Nokia and all its registered marks, and Nokia are trademarks registered by Nokia Corporation in the U.S. and other countries. All other marks are the property of their respective owners. Nokia is not responsible for the content of any advertisement. All other marks are the property of their respective owners. All other marks are the property of their respective owners.

Take Notes

Lotus to train nontechnical users in human implications of groupware

By Tim Ouellette

Lotus Development Corp. is trying to attract the next wave of Notes users by addressing a problem groupware has had from the beginning: getting people to understand it.

The Cambridge, Mass., company has announced three training seminars that tackle the human factors of groupware. Those include the impact of electronic collaboration on the work environment, how to develop workable teams and how to systematically approach the changes that can occur with groupware.

"Lotus needs to expand Notes' business client base beyond technical support people and developers," said Ros Berry, technical risk analyst at Barnett Banks Inc. in Jacksonville, Fla. "You need to grow to financial and marketing people that this has strategic benefits."

While widely used now, Notes had a slow start at Barnett because there wasn't a clear exploitation up front of what Notes was and what it was supposed to do for the organization, Berry added.

Analysts said they often see Notes installations that don't live up to their potential because users don't fully understand or prepare for the changes it brings.

Stumbling blocks to full implementation of Notes include workers not using it enough to be-

come comfortable with it, poorly developed applications and users' reluctance to share information. In many cases, Notes becomes nothing more than a glorified electronic mail system.

"Since groupware is such a fundamental change in the work environment, the human factor issue is significant to the success of a groupware deployment," said Ian Campbell, an analyst at International Data Corp. in Framingham,

Mass. "I don't think even Domino [Lotus' combined Web/Notes server strategy] will have the same effect into this situation as it begins to roll out Notes. Recently, the group's senior executives took one of the over-

view seminars. The seminars are needed because 'I find that there is a general lack of understanding of what Notes is,' said Jon Whiteman, manager of collaboration technologies at the office products company in Diamond Spic, Calif.

But companies trying to roll out Notes 4.0 this year may have to wait a bit to get the training. Lotus is letting its channel partners hold seminars, but they must be certified for the courses before any can be held.

Notes or Web groupware?
See page 49.



Barnett Bank's Ros Berry: Lotus must demonstrate Notes' strategic benefits to regular business end users

Peeking at browsers			
Microsoft shipped a second beta version of Internet Explorer last week that some users say closes the performance and functionality gap with Netscape's Navigator			
Microsoft	SHIP DATE	NOTABLE FEATURES	DRAWBACK
Internet Explorer 3.0	Late summer (in beta now)	Built-in Java compiler and ActiveX support	No unit version
Internet Explorer 4.0	Q3 1997 (in beta late this year)	Standalone with Windows, Windows 95 and NT GUIs	
Netscape	SHIP DATE	NOTABLE FEATURES	DRAWBACK
Navigator 3.0	Late summer (in beta now)	Including Internet Explorer and ActiveX support	No unit version
Navigator 4.0	Late this year	Integrated Email and support for OpenMarket's OpenMarket	

*Prices vary depending on number of copies bought, but single copies are \$49

Microsoft

CONTINUED FROM PAGE 1

pages than comparable test versions of Netscape's Navigator 3.0, said several users who have tried both products. Explorer also supports most of the same fancy HyperText Markup Language tricks as Navigator, such as frames.

"Microsoft has almost completely closed the performance gap," said Bob Duran, a systems engineer at Advanced Systems Consultants, an information systems consulting firm in Lenexa, Kan. That, combined with the fact that users can get Explorer for free or bundled with Microsoft operating systems, means Netscape is under more pressure than ever to innovate, observers said.

Imperial Oil Ltd. is weighing Navigator against Explorer for its new version every three to six months — has started to annoy some users (see June 25 Computerworld story at www.computerworld.com).

The squabbling between Netscape and Microsoft may even

But Navigator does trump Explorer in other ways.

For ships with a mix of operating systems, Navigator is the way to go, said John Swartzendruber, a technical manager at Eli Lilly and Co. in Indianapolis. Explorer works only with Windows and Macintosh versions.

Lilly runs Unix, Windows, Macintosh and other servers and PCs and wanted to avoid having different browsers on different platforms, Swartzendruber said.

At light race

Microsoft and Netscape are on the same timeline, neck and neck, to ship Version 3.0 editions of their browsers (see chart).

But the war is wearing on some users.

The head-spinning pace at which browser upgrades and pre-release copies roll out — a new version every three to six months — has started to annoy some users (see June 25 Computerworld story at www.computerworld.com).

The squabbling between Netscape and Microsoft may even

hamper IS efforts to integrate technologies from different Internet vendors.

For example, a webmaster at a national retailer said he wishes Netscape would include native support for Microsoft's ActiveX programming technology in Navigator, just as Microsoft relied on supporting Java. Netscape has said only that a future Navigator release will support ActiveX via third-party packages.

"All this is a lot of heartache for us — all this marketing and fighting," the webmaster said. "You quickly get backed into a corner," feeling that one product must be chosen over the other, he added.

Then again, perhaps neither vendor will win the whole browser market any time soon.

"I don't expect one product to crush the other," said Melbaie Ellis, author of *Internet Business Strategies*, a how-to book due in September. Most companies will "revisit the issue with each new release," she said.

Will the Web collapse? See page 49.

Toronto

CONTINUED FROM PAGE 1

Ryan, vice president and chief information officer at CT Securities International, in Toronto. Her company's internal trading system was delayed by the exchange's problems.

The exchange agreed in March to pay \$2 million for a trading system from the Paris Bourse rather than build its own replacement for the 20-year-old Canadian Automated Trading System (CATS).

Ironically, the new system is a re-engineered version of CATS,

which the Paris exchange bought from the Toronto exchange a decade ago.

But the deal with the house came only after a painful in-house effort to upgrade CATS, which was written in assembly language to run on hardware from Tandem Computers, Inc.

"We kept getting louder up in internal and technical problems," said Fred Ketchen. A senior vice president at investment dealer ScotiaMcLeod, Inc. in Toronto, Ketchen chaired the exchange's Board of Governors during two years of the project.

Those problems included an overly ambitious schedule, glitches in the proposed Unix-based client/server technology and difficulties matching the exchange's internal messaging format with those of trading firms.

"Eventually, the new president of the exchange [Rowland Fleming] decided the better way perhaps was to buy rather than build," Ketchen said. The project, which originally called for the physical trading floor to be closed in 1995, also slipped in its schedule because of the exchange's growth.


Application development

ding said. Installation of the Paris system should be completed by the end of next year.


The Paris version processes trades on Tandem hardware, but it will use a bank of Unix servers from IBM and Sun Microsystems, Inc. to handle communications with trading workstations. It uses Cobol rather than assembly language.

"Certainly, I really would rather that this had been done two years ago," Ryan said. "But I have a lot higher degree of confidence that they will be able to deliver now."

OpenDoc is ready for serious reviews. See page 54.



Netra makes your intranet run. Netscape and Java make it someplace you want to go.



Intranets. They streamline communications and give your company the edge it needs to compete. That's why we created Netra™ (the servers built exclusively for the intranet). Each comes with essential software that make deployment and management a cinch. Software like JavaScript and the Java™ Developers Kit so you can begin developing and using applets and applications right away. Tools like Netscape™ Navigator Gold for authoring, Netscape Enterprise Server for world class web serving, and Netscape LiveWire for management. In one stop, you have everything you need to manage, create and control your intranet applications. Little wonder Netra is the choice of intranet professionals and where your business truly wants to go today. For more information, contact us at <http://www.sun.com> or call 1-800-786-0785, Ext. 385. **THE NETWORK IS THE COMPUTER.**



JAVAJOINT ONLINE

©1995 Sun Microsystems, Inc. All rights reserved. Sun, Sun Microsystems, the Sun Logo, Netra, J2E, Java, and The Network Is The Computer are registered trademarks of Sun Microsystems, Inc. in the United States and other countries. Netscape is a trademark or registered trademark of Netscape Communications Corporation.

5 FIVE Way

My Company Can Help Your Company Make Better Business Decisions

The best way to improve
decision making is to start
with good information.
Complete. Accurate. Current.
And available to everyone
who needs it—when they
need it.

Turning corporate data into
real business information,
and delivering it to the right
people at the right time, is
our business.

We've been doing it for
almost 20 years for many of
the world's most successful
companies. And we can do
it for you. Here's how:



Dr. James H. Goodnight
President, SAS Institute Inc.

Data Warehousing There's no better way to stage the data
used in decision making. Put it where people can get to it without a lot of
nonsense—and away from your on-line transaction processing systems. Your
decision makers will get consistent and up-to-date data they can use—without
dragging down the performance of your operational systems. Whether you need
a complete end-to-end solution for data warehousing, a piece here or there,
or just some good advice, we can help.

2

Business Intelligence You've heard all the buzzwords (EIS, DSS, OLAP, Intelligent Query, Visualization). But what do they all mean? As a collection of incompatible products, they could mean trouble. But together and fully integrated into a comprehensive decision support environment, they could mean making good business sense out of reams of raw data. We provide them all. And we can design just the right mix for you.

3

Technical and Analytical Tools Of course, decision making is not unique to the business side. If you have quality issues on the shop floor or need to analyze the results of your market research, we can deliver the industry's richest set of tools for handling virtually any analytical need.

4

Applications Development If you need to build decision making into customized systems to get a jump on the competition, count on applications development tools ideally suited for decision support. Count on ours. Our iterative approach to rapid Applications development can shave months off of your development cycles, and get the right information into the hands of your decision makers faster.

5

Business Solutions Maybe you're not ready to tackle that system alone. You won't have to. Our professional services staff can help you as much (or as little) as you require. We can train you, sit beside you, or build complete decision-based applications to your specific requirements.

The Bottom Line Better decision making can give you the competitive advantage you've been looking for. And if you're a Fortune 500 company, there's an excellent chance we're already at work helping you. To find out the role our technology and services can play in your organization, and to receive our free guide, give us a call or send us E-mail at cw@sas.sas.com



The SAS System



EVIDENCE SUFFICIENT



SAS

SAS Institute Inc.
Phone 919-677-8200
Fax 919-677-4444
URL: <http://www.sas.com/>
In Canada: 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc.
Copyright © 1995 by SAS Institute Inc.

Exchange groupware goes unused

By Tim Ouellette

Users are overlooking the groupware features in Microsoft Corp.'s Exchange Server, in favor of electronic mail.

Microsoft touts Exchange as an E-mail server with integrated groupware. But

many users—including some early adopters who have been running Exchange since late last year—said groupware features, such as document sharing and the ability to develop applications on top of Exchange, aren't priorities.

"A lot of people see Exchange as the

standard upgrade to Microsoft Mail," said Ian Campbell, an analyst at International Data Corp. in Framingham, Mass. "People are not really exploring the groupware capabilities."

Some user sites aren't interested in tackling groupware; others may want more

than Exchange offers. This leaves an opening for competitors such as Lotus Notes to steal some of Exchange's thunder. Competitors can fill in the groupware gaps in a market where interest in further collaboration via computers is growing, analysts said.

"The intent with Exchange was migrating our [IBM Professional Office System] users to a client/server-based messaging infrastructure," said John Charlaubous, manager for electronic messaging at Shell Services Corp. in Houston. "We haven't yet started working on those [groupware] features."

Exchange product manager Gregg Lobdell said users aren't doing much groupware work with Exchange. But to make sure users such

as Charlaubous don't stray from the Microsoft path, the company in Redmond, Wash., will offer a more group-oriented client for Exchange later this year.

Analysts said Exchange still will experience relatively strong growth from users who upgrade from aging and unreliable E-mail systems. But with the growing interest in collaboration technologies, Microsoft may lose many more users to its groupware competitors.

For example, a user at an Exchange site in the Midwest said his firm plans to have 700 users run Exchange for E-mail and 300 or so users run Notes for groupware. The company would consider using Exchange for some groupware functions but will stick with Notes for its comparatively more powerful document repository and replication capability, he said.

Functional limits

"Exchange has very simple groupware abilities," said Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif. For example, users can't view electronic documents, such as reports stored in multiple formats, in Exchange. This limits users' ability to collaborate on projects.

And with Exchange's forms designer, "you can achieve pretty quickly some simple applications," Burns said. But to do real business collaboration, several add-on products are required that aren't found in Exchange, she said. Those include workflow automation, full-text searching and agent technology.

The basic forms designer in Exchange, which works best on 32-bit systems, also leaves out users who run 16-bit systems such as DOS or Windows 3.1.

"There are some limits on our ability to use the electronic forms designer" due to Exchange's dependence on 32-bit systems, said Erik Iversen, director of application development services at Nabisco, Inc. "I hope Microsoft does more" to improve the forms designer, he said.

Iversen said he would be interested in an Exchange development seminar to help his programmers create applications that exploit more of Exchange than just its E-mail.

Announcing Object World West.

Get a head start on the road to success at Object World West.

Objects are already helping companies like yours and IS professionals like you boost productivity, speed products to market and reach new levels of success.

In fact, in the February issue of *Wired* magazine, NeXT CEO Steve Jobs said, "Objects are...the way all software is going to be written. It's so compelling. It's so obvious. It's so much better that it's just going to happen."

There's simply no better way to learn the ins and outs of objects than by coming to Object World West, August 18-22, 1996, at the San Jose Convention Center.

- Find out how to build, measure, maintain and track object-oriented applications in many different industries.
- Hear from industry movers and shakers who are leading the charge toward objects and shaping the future of software development.
- Attend tutorials and conference sessions based on case studies which are packed with real-world examples of objects at work.
- Plus, get an up-close look at the hottest products and services from over 100 leading companies.
- Take part in IONA's *Orbit World* to be held at Object World West.

Don't miss the only no-nonsense event that focuses on the commercial and practical aspects of objects and distributed computing—Object World West.



August 18-22, 1996,
San Jose Convention Center.

Register on the Web: <http://www.oow.com/oow>

FOR MORE INFORMATION
BY MAIL
1-877-433-8330
BY FAX
1-617-433-7814
ON THE INTERNET
www.oow.com
Type "help" for addresses



Distributed
Applications
For The
Real World



SOFTWARE



From now on, if you can imagine it, you can manage it.



Informix Introduces The First Truly Universal Server.

Imagine this.

An infinitely scalable, multi-function relational database, that can be further enhanced by anyone, to do anything, with any kind of information. In other words, the INFORMIX-Universal Server.


Informix's unique DataBlade™ technology gives you the ability to manage any type of data, from text and numbers to sound, video, web pages — even time-series and geo-spatial data. And whatever else you need to unleash the power of business innovation.

Call **1-800-688-IFMX, ext. 81**, to get a copy of the Aberdeen Group's white paper. Or visit us on the web at **www.informix.com**, for examples of DataBlade technology in action.

Once you've seen Informix's Universal Server, it'll be hard to imagine managing without it.

 **INFORMIX®**

© 1996 Informix Software Inc. The following are trademarks of Informix Software Inc. or its subsidiaries: registered or the United States as indicated by ® and/or trademark, other countries worldwide: Informix®, DataBlade™. If you can imagine it, you can manage it™ is a service mark of Informix Software Inc. All other company and product names may be trademarks of their respective owners.

A high-contrast black and white photograph. The lower half of the image is dominated by the dark, solid silhouette of a statue. The statue appears to be a seated figure, possibly a religious or historical figure, with a prominent headpiece or crown. The upper half of the image is a bright, almost white sky, creating a stark contrast with the dark silhouette. In the bottom left corner, there are some dark, thin, leafless branches of a tree or shrub. The overall mood is somber and contemplative.

A few thoughts on fame

But first, a word from our sponsor.

At Compuware, we avoid the headline-grabbing antics, and, the too-good-to-be-true technologies. No gazillionaire founders turning up on Leno's show. Heck, we don't even have a blimp.

Yet.

**So, are we famous? Maybe.
Well known? *You bet.***

Over 9000 customers, planet-wide, are using REAL WORLD SOLUTIONS from Compuware. And, our customers are growing. Bigger. Better. More competitive.

They know we're here to provide the broadest possible service and software support for today's information technology professionals. Mainframe, mid-range, or client/server.

And we'll be here in the future.

We'd like to show you some neat stuff, like Abend-AID, EcoTOOLS, and, our professional services capabilities.

Or, see for yourself. Chances are we're close by. In your I.S. department.



There's famous...

and there's useful.

That's where we come in.

**REAL
WORLD
SOLUTIONS**

Lawson widens 'net-ready app lead

By Julia King

Lawson Software is poised to take another two-step ahead of the client/server vendors that are racing to deliver Internet-ready applications software.

The Minneapolis vendor this week will announce Insight, a major new release of its client/server financial and human resources software. Virtually every part of Insight can be accessed over the Internet or a corporate intranet.

Earlier this year, Lawson was the first package provider to offer browser-based access to its applications.

Insight contains new activity-based costing, workflow and Internet capabilities that let users deliver a wide array of World Wide

Web-based, self-service applications.

"Lawson has a very clear idea of how the Web can benefit their customers," said Clare Gillan, vice president of applications research at International Data Corp. in Framingham, Mass.

Many other vendors "are still trying to figure out how to incorporate the Web into their applications," Gillan said.

Insight will be shipped as four "process suites" — financials, human resources, procurement and supply chain. The cost per suite is approximately \$150,000 for a 30-user license.

At the New York law firm of Skadden, Arps, Slate, Meagher & Floss, an Insight beta site, about 90% of the company's 4,000 employees have desktop PCs. The plan is to add browser software so workers can access and update — via various Java-based applets — their benefits records and other employment information over a corporate intranet.

"We want to leverage the technology employees already have on their desktops. The Web lets the entire population become Lawson users without getting into the Lawson database," said Angie Sorcher, the firm's payroll manager.

"It also eliminates a big cost because you don't have to have a [Lawson] license for 4,000 people. You can get the use from the Web," she said.

Another beta site, Applied Biosciences International, Inc. in Arlington, Va., is using the software's new activity-based costing feature to track labor and equipment costs incurred in testing new drugs for pharmaceutical companies.

The costing feature, which is embedded across all four process suites, lets users pinpoint costs to specific activities, such as recruiting customers or processing service calls from established accounts.

Steve Bork, IS director at Applied Bioscience, said a key benefit of assigning costs more accurately is the ability to subsequently bid more accurately on future projects.

Release 2.0 now here!

● Contents ● News ● Search ● Help ● TechCity



COMPUTERWORLD

The Internet Connection for the IT Community

Just six months after our inaugural launch of @Computerworld, we bring you Release 2.0 of our web site. The site is now easier to access, easier to navigate, and provides a variety of services for the IT Professional. Welcome to Release 2.0 of @Computerworld.

William Brundel
Editor, @Computerworld

News

Computerworld's editorial staff provides you with the most comprehensive and up-to-date coverage of IT news on the World Wide Web.

Stories

Search our archives for timely and relevant articles from Computerworld.

Desktop

Get your voice and see where you stand on the hot industry issues.

TechCity

The center for personal and commercial services for the IT professional.

Audio

No time to read? Listen to the day's news on the @Computerworld Minute. Or, get caught up on the latest management trends or gain insight into the industry with our audio profiles. Our audio can also be heard from 1 (800) 340-2362.



Share Your Day
@Computerworld

Your IT web address:

www.computerworld.com

INVITE TOP LT. STUDENTS

to work for your organization
in Computerworld's
1996-97 Campus Edition.
Deadline: Sept. 18

1-800-340-6474 X201

FOR YEARS,
PEOPLE HAVE BEEN
TELLING YOU
TO *unplug*
THE MAINFRAME.



Protector Insurance Company

Que vous souhaitez assurer votre entreprise ou votre domicile, Protector Insurance vous offre la couverture dont vous avez besoin. Depuis 1956, nous sommes l'un des leaders de l'assurance immobilière destinée aux particuliers. Nous pouvons également vous assurer l'assurance de la responsabilité civile des accidents.



Habitat

Netpage - [Telephone]

http://www.a-telephonie.de/telefonbur

La Suisse parait de

Netpage - [Amorelli Crank Works]

http://www.amorellivorks.it

Un'azienda di ingegneria di alta qualità in ITALIANO o ENGLISH



Amorelli Crank Works

To our customers: The mission of Amorelli Crank Works is to bring to both the manufacturer of specialized bicycles and the consumer a quality that has been recognized by the Italian state.

Netpage - [Mercy Hospital]

http://www.mercy.br/records

HOSPITAL
MERCY

FICHA DO

Carlos Prospero

Carlos Prospero deu entrada na emergência às 19:00 horas no dia 28/11/91. Foi vítima de um acidente de carro aproximadamente às 18:30 horas. Atendido pelo Dr. Bandeira. A sua mão esquerda ficou presa na porta do carro, que abriu e fechou durante o acidente. Ao ser internado, tinha dores e sangramento na mão esquerda. Havia suspeita da existência de várias fraturas e foram solicitados Raios X.



As radiografias revelaram fraturas nos 1º e 2º dedos da mão esquerda.

With S/390, you can tell

It's a new world out there. The rich corporate data and critical applications on your System/390® can be easily expanded into exciting new business opportunities via the Internet. So now you can safely make information instantly available to customers. S/390® has the outstanding capability of handling thousands of inquiries, allowing customers to connect with you all day, every day. And, when used on an

IBM System/390 and S/390 are registered trademarks, and S/390 and Solutions for e-business are trademarks of International Business Machines Corporation. Netpage is a trademark of The Netpage Corporation. Netpage, Netpage Manager and Netpage Manager are trademarks of Netpage Corporation. Copyright 1999.

ever Delight Fankor

Track 34

Down and With It Ve

Track 35

usual Arm

We Really Want To Do It

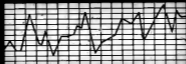
Track 36

Sound

<http://www.tokyoinvest.co.jp/>

TELEPHONE ACCOUNT T

World Stock Index



World Stock Market
Performance



Country	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990
Canada	123.15	6.58	120.87	120.87	120.87	120.87	120.87	120.87	120.87	120.87
France	207.05	2.16	204.89	204.89	204.89	204.89	204.89	204.89	204.89	204.89
Germany	207.05	2.16	204.89	204.89	204.89	204.89	204.89	204.89	204.89	204.89
Japan	123.15	6.58	120.87	120.87	120.87	120.87	120.87	120.87	120.87	120.87
UK	207.05	2.16	204.89	204.89	204.89	204.89	204.89	204.89	204.89	204.89
USA	207.05	2.16	204.89	204.89	204.89	204.89	204.89	204.89	204.89	204.89

CHARGE PER CALL

them to *plug in* instead.

intranet, the S/390 Web site offers a whole new way for your employees to get access to the data they need. To get more information about using S/390 as a Web server, and to find out about our no-charge OS/390™ Internet BonusPak software offering, visit our home page at www.s390.ibm.com or call 1 800 IBM-2468, ext. CA250. Solutions for a small planet™

IBM.

The Web pages and their contents included in this advertisement are fictitious and shown for purposes of illustration only. Any similarity to an actual Web page, company name or individual is purely coincidental. © 1996 IBM Corp.

Corporation

Back
To
Home

Appraisals

Pension

Training

Medical

Salary



Philip Francis Nolan
Computer Technical Support
Employee ID # 52809
Phone Ext. 7432

Philip Francis Nolan - hired by Megre June 12, 1993, as a computer support manager in the Info Tech division. Previous employment was a similar position at the Grouse Corporation (4/85-6/93). Currently reports to Steve Jullianson, Manager of Computer Services. Nolan has five direct report managers.

of the Week



...anyone who's
thinking about buying
Dell, Toshiba or IBM.

How embarrassing. You buy a new notebook, then find out you could have had better. Or paid less. Or both. The AST[®] Ascendia[™] P, on the other hand, is packed with some of the hottest technology around—from a 133 MHz Pentium[®] processor to our swappable SmartBay drive. Yet it still has a starting price of just \$3499^{***}. You'll even get the personal attention of a reseller and AST's 24-hour support. So with the Ascendia P, the only thing on your face will be a big, fat smile. Call 800-876-4AST, or visit <http://www.ast.com>.



Ascendia P 100 - 133 MHz Pentium processor, 11.1" or 11.3" diagonal SVGA TFT screen^{***}, up to 40 MB RAM, SmartBay modular AT CD-ROM and floppy drive, SmartPower[™] Trackpad and Lithium Ion battery.

AST.
COMPUTER

Where things are ▲

© 1997 AST Computer Corporation. All rights reserved. AST, the AST logo, Ascendia, SmartBay, SmartPower, and Lithium Ion are trademarks of AST Computer Corporation. Pentium and Pentium Inside are trademarks of Intel Corporation. Dell, Toshiba, and IBM are trademarks of their respective owners. SVGA is a registered trademark of Video Graphics Array. All other trademarks are the property of their respective owners. *MSRP. Price varies by configuration. **MSRP. Price varies by configuration. ***MSRP. Price varies by configuration. AST Computer Corporation, 10000 E. 15th Avenue, Suite 100, Denver, CO 80231. AST Computer Corporation is an Equal Opportunity Employer. AST Computer Corporation is a Minority Business Enterprise.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



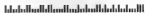
BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 558 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 558 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144



White House launches cybershield

U.S. moves to safeguard IS infrastructure



By Gary H. Anthes
WASHINGTON

President Clinton last week launched an effort to defend the nation's vital information systems from attack.

"There is a threat," said Jamie Gorelick, a deputy U.S. attorney general, at a Senate hearing last week. "It's just a matter of time before we have a cyber Pearl Harbor."

The newly created President's Commission on Critical Infrastructure Protection will be chaired by a person outside the government and consist of industry and government officials.

But Stuart Schwartzstein, a visiting fellow at the Center for Strategic and International Studies in Washington, said the government must develop better report and credibility with industry if

its initiative is to succeed.

He said a series of administration mistakes — especially its unpopular encryption policies — have made industry reluctant to cooperate.

The commission's charter is to assess the threats and come back within a year with recommendations for policies to protect the nation's computers and networks. In the meantime, the U.S. Department of Justice is forming an interim task force, led by the Federal Bureau of Investigation, to respond to attacks, help restore service, issue threat warnings and assist in criminal investigations.

"All they have done so far is talk about the problem and say how bad it is," said Caroline Hamilton, who recently served on a Pentagon-sponsored working group on information warfare. "But this [initiative] is a lot better. In-

stead of just appointing another committee, the interim [task force] is actually going to do something right now."

Gorelick said a precursor to the task force, made up of systems specialists at the FBI and the U.S. Departments of Defense and Energy, responded to the recent power failures in the West. The probe turned up no "maliciousness," she said.

"It's just a matter of time before we have a cyber Pearl Harbor."

—Jamie Gorelick,
Deputy U.S. attorney
general

The commission will seek ways to protect eight critical areas: telecommunications, electric power, oil and gas, banking and finance, transportation, water supply, emergency services and government operations.

Information systems in those areas "are so vital that their incapacity or destruction would have a debilitating impact on a regional or national level," Gorelick said. The announcements may mark a

new willingness by the White House to publicly respond to growing fears that U.S. systems are at risk. Gorelick acknowledged that there had been a reluctance to discuss threats publicly for fear that advertising the nation's vulnerabilities would invite attacks.

"But [vulnerability information] is all over the Internet," said Sen. Sam Nunn (D-Ga.). "The only people who don't know about it are the people in government with responsibility for protecting the infrastructure."

Late bloomer

Lee Sutterfield, chief operating officer at WheelGroup Corp. in San Antonio, said the commission is "definitely late in the game, but a lot better than doing nothing." But Sutterfield, a former official at the U.S. Air Force Information Warfare Center, was concerned that a high-level, bureaucratic commission might stifle promising local initiatives.

Internet monitoring tools are coming. See page 66.



Turner Broadcasting hopes to win the gold in networking

For the next two weeks, the information systems staff at Turner Broadcasting System, Inc. must contend with more than the usual network strains. Web server hiccups and user calls about missed electronic mail.

Much more.

Turner's Worldwide Information Technology Services is situated smack-dab in the heart of Atlanta and the Summer Olympics.

That means gridlock from a few million more folks downtown, contention for phone lines and security measures beyond the simple magnetic-stripe card needed to enter the data center.

Crunch time

Half the IS group shares a building with the Atlanta Committee for the Olympic Games, where security is especially tight. So Turner staffers require lots of identification tags for clearance. Some local Turner users and IS supporters are working from home to avoid the crunch at headquarters.

But IS customers around the world don't take off for the Olympics, said Charles Hebert, manager of software services support. During this ordeal, users rely on E-mail, Notes, Web servers and network connections, so some operators must remain on-site to handle problems.

On the eve of the Games, Hebert reported an interruption so far in phone service. But this week the call load, and the Games, begin. — Patrick Doyle

Taking it to the courts

Netscape, Microsoft fighting patent infringement lawsuit

By Kim S. Nash

Netscape and Microsoft haven't exactly taken a patent infringement lawsuit filed by Hollywood, Fla., inventor Robin Elkins lying down.

Elkins filed suit in May, claiming that 17 Internet vendors, including the two dominant players, violated his patent for technology that sends digital audio signals over networks.

Netscape Communications Corp. is not only denying the patent infringement charges, but also countering Elkins and his lawyers, alleging racketeering and fraud.

"They intended to defraud and cheat companies. That means racketeering," said Gary Hecker, a lawyer at Hecker & Harrison, the Los Angeles firm handling the suit for Netscape.

Microsoft Corp. has filed for summary judgment, asking the

court to dismiss all charges. Elkins recently signed a document saying that Microsoft didn't directly infringe on his patent, but indirect infringement is still a possibility. Microsoft's lawyer handling the case declined to comment.

But Elkins isn't worried.

"As we get further in [the proceedings], they will realize I have a valid, strong case against them. That's what I'm hoping will happen," he said.

But should the case go to trial, which Netscape has demanded, proving the patent valid will be just as tough as figuring

out whether anyone infringed on it, experts said.

"There's considerable debate about the ability of the [U.S.] Patent Office to judge whether a software technology is actually new and original," said Robert Cole, executive director of the nonprofit Software Patent Institute in Ann Arbor, Mich.

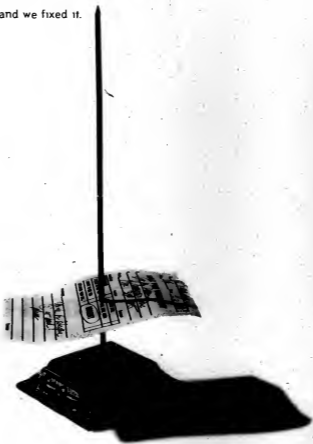
"Especially in the '70s, patents went through without a lot of scrutiny," Cole added.

The suit doesn't specify which vendors' products violate his patent, and it is unclear whether the alleged offenses are direct, indirect or unintentional.



While you were out:

your communications system
called us, told us about a glitch
and we fixed it.



Patented "EXPERT System" detects and repairs problems automatically (while you're working, meeting, fishing, etc.).

Works on multimedia communications systems (data and voice) like DEFINITY® Enterprise Communications Server, and on your data network as well.

Lets you maximize uptime and focus on your business.

Can't get automatic remote diagnosis from other communications guys.

Good reason to call: former Business Communications Systems division of AT&T, now Lucent Technologies.

Lucent Technologies

Bell Labs Innovations

211 Mt. Airy Road
Basking Ridge, NJ 07920
www.lucent.com/BusinessWorks
1 800 325-7466 ext. 954



We make the things that make communications work.™



OR



Volume 1 • Number 2 • July 22, 1996

COMPUTERWORLD intranets

THE MANAGER'S GUIDE TO WHAT'S REALLY IMPORTANT

PROJECTS

AT&T's new intranet brings automated business procedures to the desktops of 10,000 customer service reps.
Page 4

ADVICE

Think of intranets as corporate utilities. Focus on creating a secure infrastructure; users can provide content and applications.
Page 4

EXPLAINER

Hybrid firewalls: The new generation combines authentication, packet filtering, application proxies, encryption.
Page 6



ANALYSIS



INNERSECURITY

BY GARY H. ANTHERS

Since your intranet is closed to the public, you needn't worry about things that go hack in the night. Right?

Wrong. Intranets are prime targets for disgruntled employees, hackers and competitors.

"Internal networks are now taking on all the properties of the public networks that frighten us — openness, complexity and flatness," observes Bill Murray, a security consultant at Deloitte & Touche.

Worse, user-controlled intranets can leave security to the clueless.

The good news is, established security technology and management practices transplant well into the intranet environment.

Here's a quick spin through some effective tools and tactics.

TECHNOLOGY TACTICS

FIREWALLS

This protective software and hardware blocks unwanted users and activities from intranets. Some companies go a step further, breaking internal nets into subnets isolated by firewalls.

The drawback: Such network balkanization may sacrifice hard-won connectivity.

ACCESS CONTROL

Protecting individual systems and applications with passwords and other traditional protections may make more sense than using firewalls. These measures are less costly and less likely to block desired activities.

Example: The California Environmental Protection Agency uses passwords and built-in Unix security — such as read/write permissions — to protect the confidential intranet-based data provided by pesticide manufacturers. The agency has an Internet firewall that protects the organization from the public, but no firewalls that protect intranets specifically.

FIRE FENCES

Boston Edison Co. employs "fire fences" — routers programmed with user-specified data packet-filtering — to guard several intranets.

"We are doing traffic policing," explains John Dubiel, Boston Edison's planning manager. His particular worries are less about malicious intranet activity than accidents that could slow

or crash a key subnetwork.

ENCRYPTION

Outside the military, use of encryption is not widespread. But encryption is emerging as a viable intranet security technology. A few companies encrypt files and messages passing over intranets. Almost none scramble data storage.

But immature technology makes encryption "a management nightmare," warns David Bauer, a principal in information systems at Morgan Stanley, an investment firm in New York. Vendors, especially those who sell firewalls, are rushing to simplify products.

INTRUDER HUNDS

"Intrusion detection" software and other audit tools that spot outsiders and

DYSFUNCTIONAL FAMILIES





ILLUSTRATION BY TERRY PATRICK

suspicious network activity are less useful on intranets, according to Richard Mandelbaum, president of NysenNet, a Great Neck, N.Y., Internet service provider.

Better are sophisticated new audit tools built for the Internet and intranets, such as InCharge from System Management Arts, Inc. in White Plains, N.Y. The software manages Web services, electronic mail, domain name service, file transfer protocol and Usenet news services. It can apply access controls by service, network protocol, network address, time of day and user.

MANAGEMENT TACTICS

BUILD IN SECURITY

Short-sighted companies and many non-IS leaders may ignore security. That's because they think it has little impact on user satisfaction or the bottom line. Resist the temptation and build in security from the project start.

Example: One company, which requested anonymity, hired a young Web wizard to establish an intranet. Unfortunately, he never met with the IS

security officer. A subsequent network audit revealed costly security flaws.

SOUND POLICIES

Intranet firewalls and passwords mean nothing if confidential data gets posted in a public place, notes California EPA systems analyst John Stutz. IS managers and consultants agree: Written policies and employee security training are key.

Tip: Post your security documentation in hypertext on intranets. "It's a good way to get security documents to the right people at the right time," says Murray, former IBM security czar. And it turns a security liability into a security asset.

Annette is Computerworld's senior editor for government and security.

ONLINE

For an expanded version of this article, see our online version at www.computerworld.com/intranets.

Also on the site this month:

- Conference: "Are firewalls sufficient for intranets?"
- QuickPoll: "How secure do you feel?"

Behind the Firewall

Intranets are Darwinian.

Strong companies with good security will get stronger, taking intranets in stride. Companies with shabby security can say hello to a new world of lower pain.

Fortunately, evolution by definition builds on the past. Many established Internet security prac-



tices and technologies transplant well inside the firewall. The aim is the same: Create solid security without going

easy and/or breaking the budget.

A new wave of intranet security products should take some hardware off the shelf. Even so, if your security is shabby, now's the time to make it stronger. Bring in hard goods if necessary. Sure, it will cost you three figures at best, but it could save you a lot later.

Head the preventive counsel of TV show/cocktail party fix, who advised: "Tip of My of My is in the ball!"

Joseph Maglitta
Editor

COMPUTERWORLD intranets

EDITOR

Joseph Maglitta

ONLINE EDITOR

Michael Fitzgerald

MANAGING EDITOR

Aime McCrory

ART DIRECTOR

Jane Genovese

EDITOR, COMPUTERWORLD

SPECIAL PROJECTS

Bruce Rayner

Phone: (800) 343-6474

E-mail: joe_maglitta@cw.com

Fax: (508) 875-8931

Online version:

<http://www.computerworld.com>

ADVICE

Today's intranet supports only the Web and has an ill-defined relationship with the installed base of proprietary network operating systems like NetWare. This will change. Over the next four years the role of the proprietary (network operating system) will fade as the intranet is enhanced with essential, standards-based services, Tom Pincus, analyst, *Forrester Research, Inc.*

The technology of intranets is a slow death. How I can't say that was in a set of mouse-chases. The number one technical challenge is going from current state to end state. [In a finished intranet], it's balancing time, economics and the current technology. When do you turn something off and when do you turn it on and how? Allen Frank, chief technical officer, *KMPG PwC Newark*

Whether you intend it or not, the intranet is going to be a safety infrastructure. After people get comfortable with the technology and management, it's a shockwave or official pilot, you get into the infrastructure development phase. A lot of companies just sit around and wait. When



you get there, you're not going to do a traditional pilot project first. Your main objective should be, "How can I implement the infrastructure so that everyone can participate?"

Think about who should be screen providers, content providers, application providers. Steve Telford, intranet consultant, *Amdahl Corp.*

Current systems management tools are not equipped to deal with the technologies such as hypertext, Java, CGI. In fact, the systems management tools for existing enterprise software market are so ill-equipped that those vendors will be spending the next few years improving those tools to meet today's requirements. (Mike Back, intranet analyst, *Forrester Research*)

PROJECTS

AT&T Corp. Customer Care Division

Basking Ridge, N.J.
The largest U.S.
telecommunications company

Gene Speicher, Division Manager
Mark Francis, Desktop Solutions Manager

What they're doing

Creating intranet-based knowledge management system that gives 10,000 customer service reps desktop access to business procedures and policies.

Replaces

Manual binders with Post-its attached; classroom training; individual access to 20 legacy systems.

Benefits

Helps consolidate 27 call centers into one. Cuts annual training time from 50 days to 25. Creates single point of contact for customers. Reduces average call length by 50%. Enables AT&T to enter the local service market.

Cost/time

Budget not available. Two-year project, 50% done.

Staffing

Initial process consulting from McKinsey & Co.; 25 consultants from Renaissance Solutions for knowledge management system; 125 content developers; 20 internal IS developers.

Tools

Netscape 1.1 browser, Web Author, various Unix desktop workstations, Motif GUI, two Hewlett-Packard Co. servers.

Biggest technical challenge

"You're never done. The knowledge always changes and evolves," Francis says.

Biggest people challenge

Building a process and organization that will keep content fresh, and quelling

worker nervousness. "People know this is the leading edge," says Speicher. "They don't want to get left behind. We have to take pains to make sure they understand they are going to participate in a phased, logical way."

Advice for IS

"Don't fool with the content," Francis says. "Develop a tool set and infrastructure that allows partners to easily get into it. Do everything you can to make getting content into your search engines as easy as possible."

Next steps

Put remaining 5,500 small business reps on system by year's end; integrate with 20 legacy systems; offer customer self-service via World Wide Web site.

— Joseph Maglione

ONLINE

For an expanded Q&A with Speicher, see our online version at www.computerworld.com/intranets. Also featured:

- Speicher speaks: RealAudio
- Knowledge management graphics, screen shots
- Link to AT&T's home page

GENE SPEICHER,
DIVISION
MANAGER,
AT&T: "The diversity of the intranet and the tools at hand."





Netra makes your intranet run.
Netscape and Java
make it someplace you want to go.



Intranets. They streamline communications and give your company the edge it needs to compete. That's why we created Netra™, the servers built exclusively for the intranet. Each comes with essential software that make deployment and management a cinch.

Software like JavaScript and the Java™ DevelopersKit so you can begin developing and using applets and applications right away. Tools like Netscape™ Navigator Gold for authoring, Netscape Enterprise Server for world class web serving, and Netscape LiveWire for management. In one stop, you have everything you need to manage, create and control your intranet applications.

Little wonder Netra is the choice of intranet professionals and where your business truly wants to go today.
To learn more, contact <http://www.sun.com> or 1-800-786-0785, Ext. 385. **THE NETWORK IS THE COMPUTER**



©1997 Sun Microsystems, Inc. All rights reserved. Sun, Sun Microsystems, Netra, JavaScript, Java, Netscape, and the Network is the Computer are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States and other countries. Netscape is a trademark of Netscape Communications Corporation.

Drill Down	Drill Down	Drill Down	Drill Down	Drill Down
REPORTS: Building Internet Security with the Firewall Internet: You more than just a Web browser and mail agent, and medium-term advice for Internet Research Inc. Cambridge, Mass. (http://www.fortinet.com) (617) 397-7050	PICK OF THE LEEKS: Internet Research announces a new group who provide security solutions and tools, and a new website (http://www.fortinet.com)	BOOKS: The Corporate Intranet New Brunswick, N.J.: Wiley, 1995. \$39.95. 304 pp. ISBN 0-471-58111-1	CD-ROMS: The Corporate Intranet New Brunswick, N.J.: Wiley, 1995. \$39.95. 304 pp. ISBN 0-471-58111-1	CD-ROMS: The Corporate Intranet New Brunswick, N.J.: Wiley, 1995. \$39.95. 304 pp. ISBN 0-471-58111-1

EXPLAINER

NEW HYBRID FIREWALLS

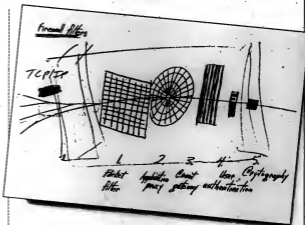
Firewalls used to come in well-defined categories: packet filter, circuit gateway or application proxy. Many new offerings are hybrids, employing two or more filtering mechanisms and a mix of techniques.

Some use authentication, which requires users to log in through a server with a password. Others use data encryption, which scrambles outgoing files that contain sensitive information. A system on the other end with the encryption algorithm decrypts it.

The diagram at right represents a composite of these elements. Firewalls don't try to encompass all of them; users mix and match based on their needs.

—Charles Babcock

Visit our Web site at
www.computerworld.com/intranets for
 links to security-related Web sites or
 to consult our
 glossary.



1. Packet filtering

This filtering is often the first on incoming traffic. A router examines each packet and, by following rules programmed into it, accepts messages from certain servers or nodes and drops all others.

2. Application proxy

This special-purpose software restricts incoming traffic to a specified application, such as your E-mail system or Lotus Notes. Likewise, outgoing traffic can be restricted if it comes from an unauthorized application.

3. Circuit level gateway

This gateway connects an outside TCP/IP port to an internal destination, often a shared resource like a printer. An access control mechanism on the gateway determines whether the user connected to the TCP/IP port is coming

from a source authorized to reach the printer. If the user is authorized, the message is passed on without review.

4. Authentication

A system like Kerberos, a standard in the Unix world, gives a user seeking access to the internal network a private key shared with a service on a host. When a key distribution center clears the user's key, it unlocks access to the host service.

5. Encryption

Most outside networks, including the Internet, offer opportunities for listening devices to sense and capture the traffic as it moves along. Encrypting an incoming data stream and passing it through a firewall safeguards against its being picked up.

Babcock is Computerworld's technical editor.

Netscape's James Barksdale on Informix.




**James
Barksdale**
President and CEO,
Netscape
Communications

"Netscape partners with Informix because of its unique Web database technology.

Together, we provide customers an ideal solution for next-generation, high-performance, content-rich Web applications."

**Jeff
Hudson**
VP of Business
Development,
Informix

"The Web requires a database that combines high performance with the ability to manage a wide range of new datatypes—image, video, text, geo-spatial, and more. Informix and Netscape enable customers to quickly develop powerful, innovative Web applications that meet any business requirement."



At Informix, we deliver innovative database technology for a growing number of industry leaders worldwide. By teaming with companies who share our vision, we provide our customers with the solutions they need to stay ahead of change, make the most of emerging opportunities, and gain a competitive edge in business.

 **INFORMIX®**

© 1996 Informix Software, Inc. All rights reserved. The following are trademarks of Informix Corporation or Informix Software, Inc. or their subsidiaries, registered in the United States or indicated by ® and ® elsewhere: other company names, product names. All other names or marks may be trademarks of their respective owners.

FRUSTRATED ABOUT HOW TO IMPLEMENT AN INTRANET? PUNCH SOMETHING.



1-800-409-6224

Trying to find accurate information in the midst of all the intranet hype is a challenge. Relax, You'll feel a lot better when you get the facts from the industry experts. Call for your free Forrester Reports on intranets and Web server software. Both analysts and the trade press agree, if you're building an intranet, you need to consult Netscape.

Forrester defines Full Service Intranet as: standardized e-mail, directory, file print, and network management. Netscape gets it. And with SiteSpot it has begun to deliver on the vision.
—The Forrester Report
The Full Service Intranet, March, 1996

And PC WEEK said:

For corporations planning to use internet-based technologies for internal use, [Netscape's] SiteSpot is shaping up as a better alternative...
—PC WEEK, May 13, 1996

Netscape's full range of intranet solutions provides greater functionality and costs less to implement than proprietary intranet solutions like Lotus Notes and Microsoft BackOffice. In fact, when Forrester polled professionally managed Web sites, 80% indicated they had chosen Netscape. So call, or visit our Intranet Solutions site at home.netscape.com to find out for yourself. And breathe a sigh of relief.



NETSCAPE

Computer Industry

Computer Industry

Strong results defy slump in tech stocks

By Juan Carlos Perez

After a stormy week and a halt that saw technology stocks plunge on disappointing reports from various industry pillars, several big-name computer companies last week reported strong earnings.

The positive earnings show that Wall Street's loss of confidence in computer industry stocks was unwarranted, analysts said. Computer companies across the board recently saw their share prices drop after disappointing reports from companies such as Hewlett-Packard Co. and Motorola, Inc.

Investors should realize from last week's strong reports that the computer industry must be looked at in segments, not as a single entity, said David Takata,

an analyst at Gruntal & Co. in Beverly Hills, Calif.

Large systems are doing well and so are companies that provide networking hardware, he said. And despite reports to the contrary, the PC industry is right on track, said Chris Garland, an analyst at The Chicago Corp. in New York.

For example, EMC Corp., a provider of mainframe storage products, closed its second fiscal quarter with revenue of \$545 million — a quarterly record — up from \$479 million in the same period last year.

And enterprise software vendor Computer Associates International, Inc. achieved its 19th consecutive quarter of double-digit growth with its first fiscal quarter, which ended June 30. Revenue was \$792 million, up from \$577.4

million in the same period last year. Net income also rose from \$68.5 million last year to \$119.7 million.

"In particular, Intel's report tells us there's no fundamental decline in PC demand," Garland said. "There's been a lot of over-reaction."

Intel Corp. closed its second fiscal quarter with net income of \$1.04 billion, up from the \$479 million net income reported in the same period last year. Revenue rose to \$4.82 billion from \$3.89 billion last year.

And Garland predicts the PC business will be further helped by expected good earnings from Dell

Second quarter 1996 earnings

Company	Revenue April 1996 (\$M)	Percentage April 1995 (%)	Change April 1996 (\$M)	Percentage April 1995 (%)
Apple Computer	\$2.17B	-15%	-\$32M	NM
Compaq Computer	\$792M	37%	\$10.7M	35%
EMC	\$545M	14%	\$87M	-7%
Hewlett-Packard	\$230M	38%	\$21.6M	7%
Intel	\$4.82B	29%	\$1.04B	38%
Sony	\$6M	60%	\$862,000	147%

Computer Corp., Compaq Computer Corp., and Gateway 2000, Inc. in the coming weeks.

Even embattled Apple Comput-

er, Inc. surprised analysts with stronger-than-expected earnings. Apple narrowed its losses to a \$32 million net loss.

Amdahl sees \$250M loss with change in direction

By Michael Goldberg

Amdahl Corp. expects to post a \$250 million quarterly loss next week as it struggles to branch out from its mainframe roots.

The company said it will write off \$130 million worth of outmoded, water-cooled, bipolar mainframes. These machines have suffered dramatic price plunges in the year since System/390 rival

1996, up from 45% last year. In 1995, Amdahl posted about \$28.5 million in profits on revenue of \$1.5 billion.

That change in product mix — and Amdahl's balance sheet — gives reason for long-term optimism, said Thomas Rostky, a financial analyst at Donaldson, Lufkin & Jenrette Securities Corp. in New York.

Candle shines on CleverSoft

By Bob Francis and Tim Ouellette

Candle Corp. this week will jump into groupware management with the acquisition of CleverSoft, Inc., a provider of Lotus Notes management software.

With the acquisition, Santa Monica, Calif.-based Candle will add application management to its current line of systems and performance management products. Candle, which is privately held, didn't announce terms.

CleverSoft's flagship product is CleverWatch, which monitors and manages Notes servers. Candle

officials said they plan to add the product to Candle's Command Center systems management tools for Windows, Unix and Windows NT environments within two to three months.

CleverSoft, a 3-year-old start-up based in Scarborough, Maine, has been successful in snagging harried Notes administrators with tools to manage Notes servers. Those users seemed pleased with the acquisition.

"This gives them [CleverSoft] a lot of backing," said Mike

Libretti, a Notes administrator at a large manufacturing firm based in the Northeast. "I think they'll be more focused with the money behind them from Candle."

The integration with Candle's Command Center tools will help users manage both legacy and newer groupware networks from one location. And the move gives Notes users another option to connect their Notes applications to enterprise systems.

Becoming aggressive

According to Paul R. Mason, an analyst at International Data Corp. in Framingham, Mass., Candle's move shows some new aggressiveness on the part of the company. "This puts a stake in the ground for application management," he said.

Candle said it plans to add application management products for SAP AG, PeopleSoft, Inc. and custom-developed applications.



IBM introduced CMOS mainframe models, which are air-cooled and less costly to use.

After Amdahl's three consecutive quarters in the red and its traditional mainframe business facing stiff competition from IBM and Hitachi Data Systems Corp., some industry observers are skeptical about the company's ability to pull out of its tailspin.

But the company is making progress in its efforts to derive more revenue from software and services. The company said those nonhardware sales will constitute more than 60% of total revenue in

While playing catch-up to introduce its own CMOS-based mainframes, due out in bulk shipments in the fall, Amdahl has sought to branch out.

Besides reselling Sun Microsystems, Inc.'s Unix servers, the company has spent \$46 million in the past year to buy two technology consulting companies, DMR Group, Inc. and Trecom Business Systems. And this fall, Amdahl is due to start selling its own line of Windows NT servers, Evista JCM, May 6].

Staff writer Juan Carlos Perez contributed to this story.

(www.computerworld.com)

JULY 22, 1996 COMPUTERWORLD



Source: The Yankee Group, Boston

You see a horse race. We see two thoroughbreds.



Microsoft

WHERE DO YOU WANT TO GO TODAY?



A lot of other companies do, too. They're running both the Windows® 95 and the Windows NT® Workstation operating systems. Why? Because they want to realize the benefits of a more reliable, more manageable operating system. They also want to run the latest versions of their applications* and take advantage of exciting new Internet technologies. That's why seven out of ten organizations* have deployed (or are planning to deploy) Windows 95 and/or Windows NT Workstation: They know that both are safe bets.

The reason we developed both operating systems is twofold: First, to achieve maximum compatibility with our customers' existing hardware and software, and second, to provide them with an even more reliable and secure operating system. Today, customers can run most of the same applications across both Windows 95 and Windows NT Workstation. And soon, with the release of Windows NT Workstation 4.0, both products will share the same user interface.

What's the right mix for your organization? That depends on what you need. Windows 95 is the easiest way to migrate to 32-bit Windows. It not only supports a third more hardware devices than Windows NT Workstation, it also has lower system requirements. Windows 95 also offers greater compatibility with certain MS-DOS® applications. What's more, it has two functions that Windows NT Workstation, for the time being, does not: Plug-and-Play, and Power Management for mobile users. Windows NT Workstation, on the other hand, offers greater reliability and security, thanks to its advanced microkernel architecture. It's simply one of the most powerful and robust 32-bit desktop operating systems you can get.

So if you thought you needed to hedge your bets, you don't, because this is no horse race. In fact, we will continue to support and update each product in the future since our customers continue to want both the broad compatibility of Windows 95 and the power of Windows NT Workstation.

For more help determining the best mix for your company, visit www.microsoft.com/windows/mix2/

© 1995 Microsoft Corporation. All rights reserved. Windows, Windows NT, and Windows 95 are registered trademarks and Office is a trademark of Microsoft Corporation. *According to PC Data, April 1995 Pulse Report, seven of the top 10 selling business applications require Windows 95 or Windows NT. **According to a survey of over 500 North American companies with 50 or more employees, conducted by SAS International, Inc., March 1995.

Viewpoint

Microsoft plugs in

Hold off on last rites. Cancel the funeral procession. Like it or not, Microsoft is quickly becoming a major force on the Internet.

As demonstrated by a *Computerworld* survey of more than 700 IS managers that was published last week, Microsoft is pulling even with Netscape in Web server mind share, a leading indicator of buying intentions. Equally remarkable is the speed at which Microsoft closed the gap; its mind share doubled in just three months.

Netscape is clearly still the browser leader, with more than 70% of the corporate installed base. But Microsoft's Internet Explorer 3.0 is a pretty good alternative, and it's free. Anyway, I don't think browsers are going to count for much in the long term. Users shouldn't have to flip to another application every time they want to grab something off the Internet. Over time, Internet functions will be absorbed into the operating system and desktop applications. Guess who benefits from that?

Sure, you can argue that Microsoft is gaining market share by giving away products. But that's exactly what Netscape did with Navigator and Sun with Java. Microsoft's strategy is the same as the one it used to win in operating systems and applications: enter the market late, sell stuff cheap, outlast the competition, then raise prices. Microsoft certainly won't dominate the Internet the way it has the desktop, but it doesn't have to. All it has to do is give people a reason to continue buying PCs, most of which will be stuffed with Microsoft products.

I see three possible developments that could stand in Microsoft's way. One would be trying to make Internet standards proprietary. But that would be stupid. A second involves the operating system-less network PC concept taking off. Given the profound lack of end-user enthusiasm for this concept, I think that's unlikely. A more realistic scenario is that the high costs of building Microsoft's Internet business could slam Microsoft's earnings, tarnish its reputation of invincibility and demoralize employees who hold stock options. That's a possibility, but it would take more than a couple of quarters to erode 50% desktop market share or stop Windows NT dead in its tracks.

In the meantime, corporate IS managers will continue to favor dealing with a few companies that can deliver competitive, integrated products. And Microsoft will be high on their list.

Paul Gilin
Paul Gilin, editor
Internet: paul.gilin@mc.com
www.altavest.com/~paulg



Raising the red flag of 'diversity'

Your June supplement, *The 100 Best Places to Work*, was fascinating. I do, however, question one of the criteria you listed: diversity.

Once upon a time, before the PC police had waste the English tongue, diversity meant a variety of ideas, approaches, ideologies, religions, disciplines, preferences and the like. Now, alas, the mother tongue has been pre-empted by a bunch of politically correct code words. Gay doesn't mean happy or festive, black is a culture rather than a color, image defines one's merit and out-castes are irrelevant.

I take umbrage at that [diversity] criterion and your use of it. For the American workplace to have vig or it needs to compete in world markets, it needs real diversity: the competition of ideas, even those you and I don't like, to find the ones that work best and use them to win.

It seems to me that one of the prime criteria of a good place to



work is that it and your job will survive in the face of competition. Not true?

Charles H. Collins Jr.
Kenil, N.J.
clack@compuserve.net

I was pleased to see the June *Computerworld* supplement titled *The 100 Best Places to Work*. After the mention of diversity on the cover, I

looked forward to seeing how these "best places" addressed the needs of African and gay employees, how inclusive their nondiscrimination statements were, if they recognized gay/bisexual/bisexual employee groups and which had domestic-partner benefits. Sadly, all of this was missing.

I appreciated the piece on Digital Givers you ran a while ago. I hope that future articles in *Computerworld* really can be more inclusive of all of us.

David Barnett
Acting director
Office of Gay, Lesbian
and Bisexual Concerns

University of Illinois at Chicago

Given the large number of gays and lesbians in the computing field, it's rather surprising that no mention of benefits that cater to them was made in your recent supplement, *The 100 Best Places to Work*.

You might do well to examine the wide range of computer companies that offer domestic-partner benefits. Anyone who objects to such companies' practices — which amount to giving equal pay for equal work — is welcome to go back to using pencil and paper.

Don Ross
Madison, Wis.

Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Paul Gilin, Editor, *Computerworld*, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-0931. Internet: letters@cw.com. Please include an address and phone number for verification.

Consider the source

As I consume business-oriented articles and broadcasts of other media outlets such as *The Wall Street Journal* and *CNN*, I notice that whenever one of them uses material or opinions of people from within their own company or its parents or subsidiaries, they are clearly labeled as such.

I believe *Computerworld* would be well-served to follow the example of these publications. Whenever a viewpoint from an

employee of International Data Group or International Data Corp. is used, it should be noted that the source of the quote or opinion is an employee of a parent or sister company of *Computerworld*.

The benefit to readers would be a more thorough sense of the perspective and diligence of *Computerworld's* editorial and reporting staff.

William Lucas
Pensacola, Fla.

Verbatim

FROM U.S. SENATE TESTIMONY BY PHIL ZIMMER, HAWK, CREATOR OF THE PRETTY GOOD PRIVACY (PGP) ENCRYPTION SOFTWARE

For three years I was the target of a criminal investigation by the U.S. Customs Service, who assumed that [export control] laws were broken when PGP spread outside the U.S. That investigation was closed without indictment in January 1996.

Today, we live in a new world that has two major breakthroughs... The first is the coming of the personal computer and the information Age. The second breakthrough is public-key cryptography.

Encryption is just simple arithmetic as is the digital hardware. The rest of the world already uses it, and these other countries laugh at the U.S. because we are railing against nature, trying to stop it.

Trying to stop [the export of encryption] is like trying to legislate the tide and weather. It's like the buggy whip manufacturers trying to stop the cars. Even with the [National Security Agency] and the [Federal Bureau of Investigation] on the government's side, it's still impossible.

PROTECTIONS ABOUT THE INTERNET FROM THE "PROJECT MILLANNA" ONLINE NEWSLETTER, PUBLISHED BY THE CENTER FOR MEDIA STUDIES IN TORONTO

Use of the 'net for business-to-business use, as well as intranet use, can be profitable from the get-go. Use of the 'net for consumer transactions will remain unprofitable until just few months but for years to come.

The current "broadcast" [advertising] designs, upon which most revenues are generated, will... not do. The number of households that will voluntarily refuse to have anything to do with the 'net will be around everyone's, and how soon will be determined by the speed of the 'net's growth.

The herd instinct on the Web frontier

David C. Moschella



IS managers say it's a two-horse race for Web server supremacy: Microsoft vs. Netscape.

In the market for World Wide Web server software, Microsoft has come out of nowhere in just six months and is well-positioned to challenge archival Netscape next year.

As reported last week in *Computerworld's* front-page story "Clash of titans," 30% of IS professionals surveyed said they expect Microsoft to be their primary supplier of Web server software in the next 12 months, while 28% said they expect Netscape to be their primary vendor. The story suggested that integrating Web software with the Windows NT 4.0 operating system seems to have done the trick.

Mind share shift

Let's look at the data. During the first six months of this year, *Computerworld's* research unit surveyed more than 6,000 IS professionals at large and midsize sites in the U.S.

About 2,400, or 40%, of those respondents named their primary vendor now and their future supplier of Web software. What is striking is Microsoft's jump from the previous quarter, when it was in just 18% of buying plans. "Mind share" isn't the same as actual market share, but this big swing in mind share from one quarter to the next makes it clear that Microsoft's momentum is real.

Web-wise readers might be surprised to see Netscape and Microsoft described as Web server software leaders. Figures from U.K. consultancy

Netrat (www.seicraft.com), which pings some 300,000 public Web servers each month, clearly show that the Apache freeware product is the overwhelming market leader. Yet, here we have 60% of IS professionals saying that, for them, it's a race between the two superpowers next year.

Mainstream IS, not surprisingly, has chosen brand-name, commercial products that offer at least some degree of support. Looking at the data more closely, much of Microsoft's wins have come from new sites, but a significant number have come directly at Netscape's expense. We even called about 20 of those Netscape-to-Microsoft switchers again to double-check.

But how many will actually make the switch? What the survey data really shows is that 30% of the respondents expect Microsoft to be their primary supplier 12 months from now *unless something else happens* that changes their mind. This puts the ball squarely in Netscape's court.

Underlying the survey results is the old ad-

somption that either Netscape or Microsoft will win big, and everyone else will be soundly defeated. Clearly, this has been the history of the software business: MVS, DOS, Windows and other products have managed to hold near-monopoly positions. Much of the Netscape vs. Microsoft drama — not to mention their huge stock valuations — stems from the belief that this winner-take-all pattern will be repeated.

Don't count on it. The nature of the 'net makes individual products subordinate to high-level network services and standards. So, a market led by a few strong players may well evolve. Remember, even if all those planning to switch to Microsoft actually do so, the shares 12 months from now would be Microsoft with 30%, Netscape with 28% and "Other" with 42%.

Yet there is one, often unrecognized, reason why the monopoly pattern of the past might prevail: Maybe software monopolies are what users really want. One of the dirty little secrets of the software industry is that market concentration often has more to do with customers' herd instincts than with any vendor's technical or marketing brilliance. In the end, if users want competitive Internet software markets, they can have them. It's really that simple.

Moschella recently joined Computerworld, Inc. as senior vice president of research. His Internet address is david.moschella@cw.com.

A job for the Electron Protection League

Bruce Hoard



Scientists have discovered how to purge those pesky electrons clogging your chips: coherent destruction.

Irked by those pesky charge carriers clogging your semiconductors and bogging down your optical switching speeds? Tired of waiting up to a nanosecond for your electrons to take a hike? Looking for a politically correct and scientifically sound way to vent your electronic anxieties?

If your responses are, "Yes," "Yes" and "Yes," then join hands with me and welcome — in the far corner, direct from Hitachi Cambridge Laboratory and the Cavendish Laboratory of Cambridge University — the "High Tech Hammer," Coosoo-heranant Devrostraction!

That's coherent destruction, folks. Based on the use of ultraviolet light pulses, this charming new creation of the lab-bound can shave the time it takes to stamp out electrons from a laggy nanosecond down to a paltry picosecond or less. No more shoving or washing dishes while you wait for your semiconductors to purge.

Just in case you have a hard time relating to nanoseconds and picoseconds, allow me to cite a comment by Albert Heiber of the Hitachi Cambridge Laboratory, reported in the March issue of *Lightwave* magazine. Decrying the practical limitations of previous approaches to electron-

crunching, he says, "By employing synchronized light pulses, we are able to generate and destroy electrons on the time scale of our laser pulses, currently at approximately 100 femtoseconds."

That's femtoseconds, friends, and that's just plain fast. Your average femtosecond comes and goes faster than you back your car out of the garage. It's faster than a New York minute. It's even faster than the snail that comes out of your mouth when you sneeze. Now that's snail!

No limits

Now before everybody starts feeling bad for all those poor electrons — some do-gooder will probably form an Electron Protection League — let's look at the benefits of coherent destruction. Basically, it means that the speed of future optoelectronic circuits could be, according to *Lightwave*, "virtually unlimited." That's all? What's the

point? Is this nothing more than the fiber-optic equivalent of seeing how many people can be packed in to a telephone booth?

I hate show-off technologies.

Come to think of it, the whole thing seems a little cold and cruel. *Lightwave's* story talks about eliminating whole "populations" of electrons, for cripes' sake. Just like that — zap! — and who knows how many zillion electrons just bit the dust? See ya.

I suppose it's more humane that they should perish quickly, but it's really necessary to eliminate them in femtoseconds? That seems like expensive overkill. Couldn't we just put prison inmates to work smashing them with hammers, or something? Why spend all that money on research when there's a downright practical approach right under our noses?

Face it. It's no fun being an electron if coherent destruction is on your case. You've got no choice. Just when you're starting to get into it — wham! You're destroyed, albeit in a coherent fashion.

In this kind of vigilante atmosphere, the message is short and sweet: Pick up your charge and head out of town, stranger. We don't count on electrons around here no more.

Hoard is a former *Computerworld* staff writer remembered for his incoherent constructions of acronyms. His Internet address is BruceHoard@ad.com.

CHANCE
talking politics
STRANGERS

but when it comes to
RAID Storage,
be a No-Risk
RADICAL



HDS Midrange 5700 Disk and 5400 Tape Series

Stick your neck out on some topics. But on RAID storage, leave no room for debate on your obsession with avoiding risk. Choose the 5700 Series from Hitachi Data Systems. It's the RAID storage system that delivers hot pluggable controllers, fans, disks and power supplies. All with the granularity of four models based on the same architecture. So it can grow as you grow—from



modules as small as 2 GB to as large as a terabyte. And you can move from platform to platform, without ever bringing up compatibility issues. This worry-free solution also delivers selectable RAID levels, optimized microcode and an incredibly efficient cache design for outstanding performance. See for yourself. Call now and check out an evaluation unit. Then really speak your mind on avoiding risk in RAID storage.

FREE *NO RISK EVALUATION UNIT OFFER

Call to qualify and schedule: 1-800-910-2820, ext. 249 • www.hdshq.com/raid



Hitachi Data Systems

S U P P L Y I N G T H E D E M A N D I N G

*Evaluation offer valid for 30 days from issue date of this publication and does not include freight costs. Hitachi Data Systems, 750 Central Expressway, Santa Clara, CA 95050-0906. Outside the USA, call +344-590-7405.

Servers PCs

Mac clones a viable option

By Lisa Picarile

New Macintosh clones that are faster and less expensive than any machines currently offered by Apple Computer, Inc. have Macintosh users seriously considering Macintosh-compatible systems as a viable alternative.

Machines from Umax Computer Corp., Digistar Digital, Inc., Motorola, Inc. and Power Computing Corp. give users more options than ever — and users are exercising those options.

Three months ago, John Papa, a partner at the Carson Group, a financial services firm in New York, said his company, which has 150 Macintoshes, was evaluating Macintosh clones. It re-

Baltimore, said the clone makers have something Apple doesn't have. "They can copy off Apple, then tweak the clones to make them better and faster and cheaper," he said.

That is exactly what Power Computing is doing. The Round Rock, Texas, firm is set this week to unveil four new high-end Macintosh clones that are faster than any machine available from Apple (see chart below).

Most observers and users said that while initial efforts from the clone vendors may cannibalize Apple's sales, in the long run, clones will help boost the overall Macintosh platform.

"Mac clones are going to be either successful or very successful," said Piet-

thing for me and for Apple is if the Mac clone vendors are successful," Papa said.

Big deals are believed to boost the position of Macintosh clones in corporate accounts. Power Computing recently sold 3,000 systems to a division of Lockheed Martin Corp. — the largest Macintosh site in the world, with more than 40,000 Macintoshes.

"The clones seem to be finding their way to their premises," Nazarian said.

That fact has changed some Macintosh users' attitudes from wait-and-see to try-and-buy.

Considering clones

Mark Sehnem, editorial publishing director at Grueter & Jahr U.S.A. Publish-

ing in New York, said his company has five Macintosh clones in low-risk situations that are nonmission-critical areas. "The solid performance of the Macintosh-compatible machines has prompted Grueter & Jahr to invite Power Computing to bid on providing computers for the

entire editorial staff.

Papa said that, thanks to the positive experience with Macintosh clones, he now considers Power Computing a primary source and not just a secondary option to Apple.

High-end PowerPCs for the Mac OS

All systems have base-level configurations with a 25-MHz hard drive, six Peripheral Component Interconnect slots, 16M bytes of RAM and a 230-MHz graphics accelerator

	Power Computing	Apple	Umax
Processor	225-MHz PowerPC 604E	150-MHz PowerPC 604	150-MHz PowerPC 604
Cache	3M byte, Level 2	512K bytes, Level 2	512K bytes, Level 2
Video RAM	8M bytes	2M bytes	4M bytes
CD-ROM	Yes	Yes	Yes
Price	\$4,995	\$4,799	\$3,995

cently purchased 15 Macintosh-compatible systems from Power Computing.

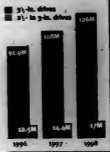
"The price was right, and they're fast machines," Papa said. "They crank."

Victor Nazarian, computer systems director at Harbour Inn Medical, Inc. in

er Hartsock, editor of "The Hartsock Letter," an industry newsletter in Alameda, Calif., who estimates that by 1998 Macintosh clones will account for 30% of Macintosh sales.

"As far as I'm concerned, the best

Projected worldwide rigid disk drive shipments



Source: Data/Forecast, Inc., Mountain View, Calif.

Disk sales heat up

By Jaikumar Vijayan and Stewart Ueck

Sales of hard disk drives are spinning through the roof. Driving those sales are dramatic improvements in technology, plummeting prices and — exploding demand for online storage.

"People are starting to store more things on disk because it is faster to access, applications and more cost-effective than storing it on the cloud," said LaMar Norman, microprocessor manager in the radiology department at the University of Florida in Gainesville. "We only keep data files and maybe the graphics libraries on the server," and all other applications reside on individual desktops, Norman said.

As a result, the radiology department's average hard disk drive capacities have increased many times over, from a mere 80M bytes six years ago to, nearly 2G bytes today. "And the interesting thing is we are probably paying less for these drives than we did for the 80M-byte drives," Norman added.

"Our disk drive capacities have gone up by a factor of three or four times over the last two years," from an average of about 200M bytes to about 850M bytes today, said Steve Booth, a microcomputer consultant at Wisconsin Electric Power Co. in Milwaukee.

Driving that capacity increase has been a variety of factors — including the migration of multiple applications.

Hard disk sales, page 46

New notebooks offer challenge to desktops

By Chris DeVoney

Although they are pricey, three new notebooks challenge desktop machines to almost every category.

Computerworld evaluated three comparable notebooks from Digital Equipment Corp., Hewlett-Packard Co. and Toshiba America Information Systems, Inc. that have prices hovering at about \$6,000. Like their desktop brethren, the notebooks — all weighing less than 8 pounds — combine a 133-MHz Intel Corp. Pentium processor with 16M bytes of memory, a 10- to 15- or greater hard disk, a multiple-speed CD-ROM drive, a 16-bit Sound Blaster-compatible sound card, stereo speakers and 16-bit color with at least 800- by 600-pixel resolution.

These notebooks are so capable that they could eliminate the need for a separate desktop system. Toshiba's Tecra has a slight edge if you need the highest-resolution screen to run many windows. Digital's Hi-

Note Ultra II has the advantage when weight is a concern. The HP Omnibook leads in multimedia skills.

Toshiba's Tecra 720C/DT

As the Mercedes of the portable set, the \$6,299 Tecra 720C/DT offers almost every possible feature for powerful office, telecommuting or presentation tasks. The emphasis is on speed and flexibility.

The Tecra sports a 12.1-in. film transistor (TFT) screen that displays 16-bit color on an incredibly dense 1,024- by 768-pixel screen. Though still overpowered by sunlight, the TFT display is sharp, capable of photorealistic presentation and has the resolution to

handle the multiple windows of Corel Corp.'s WordPerfect Office or programmer's workbench.

The 720C/DT offers a six-speed CD-ROM drive rather than the standard four speeds of most portables. The unit holds either the CD-ROM or the 3 1/2-in. floppy disk drive.

Notebooks, page 40



Servers & PCs

Notebooks offer challenge to desktops

CONTINUED FROM PAGE 39

and an external cable on the floppy allows both to be used at the same time. You occasionally need the floppy and CD-ROM on-line at the same time to install new device drivers or an operating system such as Microsoft Corp.'s Windows NT 4.0.

The built-in speakers provide somewhat tiny sound but have volume sufficient for an office. External speakers needed for larger presentations, headphones and an external microphone can be plugged in to the back of the unit.

The unit's built-in 28.8K bit/sec. fax/modem, coupled with the built-in microphone, doubles as a modest-quality speakerphone that gives employees a communications advantage when users are at an airport or hotel.

The 730CDT catches two birds in its belt for industry-standard Cardbus and Zoom Video (ZV)-capable PC card slots. Cardbus is the new 32-bit version of the PCMCIA add-on cards that let users plug in 100-Mbps network and fast SCSI-II cards. ZV video, which gives PC cards direct access to the video controller, adds better video capture, MPEG-I playback and videoconferencing capabilities than users could get with earlier notebooks.

Additionally, Tecra uses the old 115K bit/sec. infrared port, sufficient for printing but scandalously slow for file transfers or network links. Its basic 7-pound weight — almost 9 pounds with power supply and floppy disk — puts the unit on the chunky side. But the weight is worth the capabilities.

Toshiba, in Irvine, Calif., can be reached at www.toshiba.com.

Digital's HiNote Ultra II

The HiNote Ultra II is pitched as the smallest and lightest full-featured 133-MHz notebook. It weighs almost a pound less and is a half-inch trimmer in height and length than comparable notebooks.

With its optional multimedia adapter (\$699), an additional 8M bytes of RAM (\$699) to boost the total to 16M bytes and power supply (no extra charge), this notebook's traveling weight is a meager 7 pounds. By swapping modules or dropping the battery, the basic unit can hit the scales at a very light 3½ pounds. Total price, including the options: \$5,977.

With its smaller form factor, you get a 10.2-in. active-matrix display capable of 800 by 600 pixels in full 16-bit color. Digital introduced a 12.1-in. display after this review was completed. Although the pointer — a

trackball — can be clumsy, the keyboard retains its standard portable size and full functionality.

The unit snaps in to the optional multimedia adapter, which contains 4x CD-ROM dual speakers, hardware volume control, earphone and microphone jacks. Although the speakers are good, as possible, the volume adequately fills a small office.

To use a floppy drive, users must shed the multimedia adapter and mount the wedge-shaped floppy adapter underneath. Unfortunately, this arrangement prohibits using the floppy and CD-ROM at the same time, causing some double-stopping when installing some PC cards and forcing users to install Windows NT 4.0 from a network. Two Type II PC card slots are included but not the newer 32-bit Cardbus or ZV capabilities.

The HiNote Ultra II also forces some other compromises. Many ports have sliding doors, but the video-serial, port-parallel ports use a removable and easy-to-lose rubber cover.

The 115K bit/sec. infrared port is located on the left side rather than the back, forcing some shuffling on cluttered desks.

Fortunately, the HiNote Ultra II doesn't sacrifice power with its small size. For those carrying a heavy load, the lightweight Ultra II may be the perfect match, offering computing power while not adding to the load.

Digital, based in Maynard, Mass., can be reached at www.pc.digital.com.

HP's OmniBook 5500

Not the lightest or smallest, the \$6,150 OmniBook 5500 packs as much 133-MHz Pentium wallop in its 6-pound frame as one can expect.

Our test machine also featured a spacious 2G-byte hard disk drive. The OmniBook 5500's 12.1-in. active-matrix screen runs at 800 by 600-pixel resolution in 16,536 colors — large enough for presentations and true enough for displaying fresh-tones or landscape photographs. HP also offers options for National Television Standards Committee/Phase Alternating Line composite and S-Video outputs to directly connect a monitor or VCR to the computer.

The dual-stereo speakers produce good sound but lack the power to overpower a small cooey office. Jacks for external speakers, headphones, microphone and joystick fulfill all required multimedia connections.

The OmniBook uses a 4x CD-ROM drive. The floppy can be used inside or outside the system, so installing drivers or Windows NT 4.0 is no problem. The system sports two Type II PC card slots but neither are Cardbus or ZV-capable.

If you are looking to make the wireless connection to a printer or network, the OmniBook is one of the first computers to use the new 4M bit/sec. infrared port. Devices

such as the HP Netbeam IR or Extended Systems JetEye Plus and the Windows 95 IrDA drivers let users transfer or print files wirelessly from the notebook to any network device at near-network speeds.

Hewlett-Packard, based in Corvallis, Ore., can be reached at www.hp.com.

Common problems

All three notebooks share a common problem faced by those who make presents-



It's Easy To Track Down The Only Microsoft-Certified X Server For Windows 95.

NetManage Software: Easy, Affordable
Access to UNIX and Windows applications
from any PC.
NetManage Software is part of the NetManage
Integrator Family — a full suite of products designed
to help you build a powerful corporate Intranet.
Call now to get the full story today.

FREE!

1-408-342-7538

NETMANAGE

1800 GARDEN VIEW, SUITE 100, SAN JOSE, CA 95128

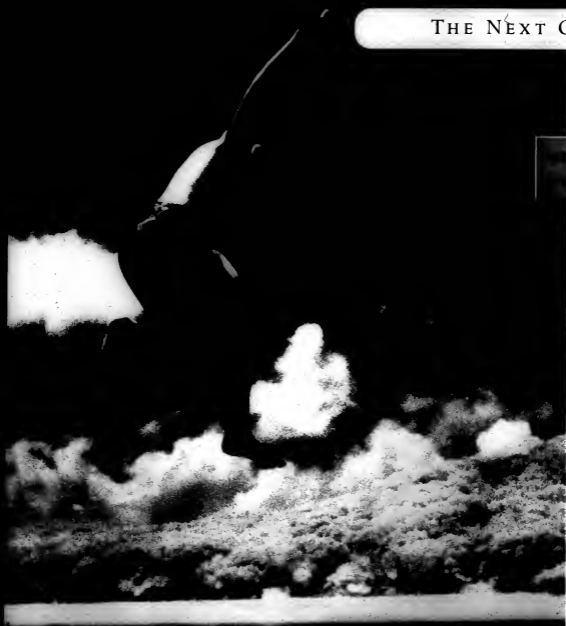
TEL: 408-342-7538 FAX: 408-342-7539

WWW.NETMANAGE.COM

PRESENTING THE NEXT GENERATION
OF INTELLIGENT MANAGEABILITY.

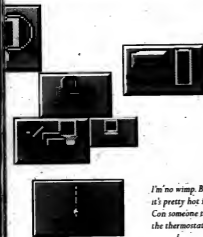


THE NEXT GEN

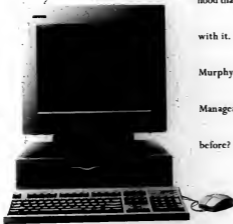


ERATION OF

what?



*I'm no wimp. Bug,
it's pretty hot in here.
Can someone turn
the thermostat down?*



The new Compaq Deskpro with Intelligent Manageability.



© 1996 Compaq Computer Corporation. All rights reserved. Compaq and Deskpro registered U.S. Patent and Trademark Office. V70 is a trademark of Compaq Computer Corporation. Deskpro is covered by our 3-year limited warranty. Thermal sensor available only on Deskpro 4000 and 6000. Some features available with Compaq Deskpro and independent software applications. Other features only available with Windows 95. The Intel Inside Logo and Pentium are registered trademarks and the Pentium Processor Logo and the Pentium Pro Processor Logo are trademarks of the Intel Corporation. Other products mentioned may be trademarks or registered trademarks of their respective companies.

Think of it as a crystal ball cleverly disguised as a computer. The new Compaq Deskpro with our newest thinking on Intelligent Manageability lets you manage the desktops on your network from one location. Suddenly you're Master of the Universe. You'll be forewarned if a hard drive's about to fail, whether on another floor or in another time zone. As before, the Deskpro backs up data on the network in case of failure. But now, a new PD-CD drive backup preserves your data locally. You can take inventory of all your hardware and software from one location. There's also a thermal sensor that monitors the CPU's temperature, plus another sensor in the hood that alerts the support desk if anyone's tampered with it. This is a computer that fully understands Murphy's Law. So what does our new Intelligent Manageability give you that wasn't readily available before? Even more control.

COMPAQ

CAN YOU PLACE A VALUE ON INTELLIGEN

To our way of thinking, Intelligent Managementability wouldn't be all that intelligent if it cost a small fortune, so we've worked hard to make the new Deskpro line not only affordable to purchase, but affordable to operate. And that's over the life cycle of your desktops.

By design, ours is based on open industry standards that ensure compatibility and integration with any network. We've also forged partnerships with Microsoft, Novell, Intel and others to give IS managers a broader range of integrated solutions. To minimize installation and configuration time, we provide an upgradeable integrated NIC and network-

ready software. This protects your investment and allows for growth.



CE?

yes

IT STARTS AT AROUND \$1,100.*

Of course, we wouldn't set you up and leave you hanging. Maintaining a Deskpro on your network is easy with continually updated support software that we deliver via our Web site and CDs. Servicing is a snap too, thanks to a quick-release CPU hood and accessible components. Equally impressive are the high-performance features. Up to Pentium® Pro 200 processors. Fast EDO memory. Choice of EIDE and Ultra SCSI hard drives. Optimized performance with Windows 95 (including Microsoft Internet Explorer) and Windows NT.**

What's more, the new Deskpro has 64-bit, high-speed graphics, perfect for any monitor, including our new V70 17" (15.67" viewable).

Ultimately what you get with Intelligent Management is lowered cost of ownership. Add to that a three-year warranty, plus dedicated toll-free technical support that's open for business seven days a week, 24 hours a day.

When it comes to managing desktops on your network, you'll be hard pressed to find a more intelligent buy. For more information, visit us at www.compaq.com, or call 1-800-392-8883.



COMPAQ

Has It Changed Your Life Yet?

*Price shown is estimated street price. Dealer prices may vary.
**Features vary by model. Monitor not included.

Hard disk sales

CONTINUED FROM PAGE 39

off mainframes to a client/server environment and migration to larger 32-bit Windows NT application environments — which require more disk space.

Trends such as those are making the growth outlook for the rigid disk drive in-

dusty better than ever, according to a recent report from Disk/Trend, Inc. in Mountain View, Calif. The company estimated that this year about 109.2 million rigid disk drive units will be sold worldwide. That represents a 21.5% increase over last year. Continued growth in shipments is forecast for the next three years, with the 1999 total projected at slightly more than 170 million drives.

As vendors try to keep up with this

mushrooming demand, users can expect to see steadily falling prices and greatly enhanced storage capacities.

The price per megabyte of online storage has been going down, said Disk/Trend President James Porter. In 1990, vendors charged OEMs \$2 per megabyte. "Last year, it was 25 cents, and in 2000, it is going to be 2 cents," Porter said.

At the same time, dramatic annual increases in disk recording densities are

pushing up typical disk drive capacities faster than ever, said the Disk/Trend report. This has resulted in a flood of relatively high-capacity drives from most vendors.

For instance, most PCs sold last year had average disk drive capacities ranging from 500M bytes to 1G byte. This year, the figure is expected to be in the 1.2G- to 2G-byte range, and next year, most hard drives will be up to 2G bytes, Porter predicted. By 1999, drives in the 5G- to 10G-byte range are expected to be common across PC lines.

While the demand for higher-capacity drives has been increasing, there is also a continuous trend toward drives with smaller disks, according to the Disk/Trend report. For desktop PCs, network file servers and mainframe storage systems, 3½-in. drives continue to dominate. Shipments of 2½-in. drives, which are predominantly used in notebook computers, are also expected to grow dramatically over the next three years.

Meanwhile, sales of hard disk cartridge drives are being boosted by the growth in demand for all types of removable media disk drives, the report said.

The report predicted that after this year, no drives with disks larger than 5½-in. are likely to remain in production.

COMPUTERWORLD'S Code of Ethics

1. Computerworld's first priority is the interest of its readers.
2. Editorial decisions are made free of commercial influences.
3. We insist on fair, unbiased presentation in all news and articles.
4. No advertising that simulates editorial content will be published.
5. Plagiarism is grounds for dismissal.
6. Computerworld makes prompt, complete corrections of errors.
7. Sexual harassment is not even or trade in computer industry circles.
8. No secondary employment in the IS industry is permitted.
9. Our commitment to fairness is our defense against slander.
10. All editorial opinions will be clearly labeled as such.

WORDS WE LIVE BY.

When you pick up a copy of *Computerworld*, you know you're getting the most objective, unbiased news and information in IS. Our code of ethics guarantees it.

Why do we make such a big deal out of editorial integrity?

Because the words you read in *Computerworld* often have a dramatic impact on your business, your career, and your future.

You use this information to evaluate new products. To get a candid view of emerging technologies. To find out the inside story on corporate strategies. To decide whether to jump ship or stay in your current job. To get the edge on your competition.

In short, *Computerworld* is filled with the words IS professionals like you live by.



WORDS YOU WORK BY.

Week in and week out, our editors and reporters call it the way they see it — on issues ranging from network management to reengineering. They dig deeply to bring you the most accurate, comprehensive news in IS.

It's no wonder over 145,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you? Order today and you'll receive 51 information-packed issues. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the leading companies using IS technology.

Call us toll-free at 1-800-343-6474, or visit us on the World Wide Web at <http://www.computerworld.com>. To order by mail, use the postage-paid subscription card bound into this issue.

You'll get the kind of straightforward, impartial reporting you can work by. You have our word on it.

COMPUTERWORLD
Everything you need to know

New Products

NSM Jukebox has introduced Mercury 40 Net, a large-capacity CD-ROM jukebox.

According to the Bensenville, Ill., company, Mercury 40 Net was designed for direct connection to a Novell, Inc. network for easy data access from any workstation on a network. It holds 150 CD-ROMs and has four CD-ROM readers. It provides control and data routing through a single Ethernet cable and connector.

Pricing for Mercury 40 Net starts at \$21,000.

NSM Jukebox
(708) 860-5100

Sony Electronics Corp. has announced DXC-950, a remote video camera.

According to the San Jose, Calif., division of Sony Corp., the camera can be flash-synchronized, which allows any photograph to be identified immediately using a connected monitor or printer. It can also simultaneously activate an external flash, still camera and other connected units.

Pricing for DXC-950 starts at \$5,800.

Sony Electronics
(408) 432-0190
www.sony.com

**PACIFIC
NORTHWEST
CAREERS**

Will be featured in
COMPUTERWORLD'S
AUGUST 5 EDITION
Deadline: Aug 1, 1996
(800) 343-6474 ext. 2021

EDS

**WITHOUT
THE
STARCH.**

The button-down attitude was fine in the mainframe world, but now the computing world has rapidly expanded. With thousands of PCs and servers, today's IT environment demands more flexibility, and more rapid response, from you and your suppliers.

Call Vanstar, the distributed computing experts. We offer the life cycle services you need to manage your IT growth: consulting and design, network planning, integration, procurement, financing, installation, and desk-side support.

With Vanstar, you choose as much, or as little, of our expertise as you need. That's why hundreds of Fortune 1000 companies have selected us to support their distributed computing environments.

Please visit us at www.vanstar.com/nostarch or call us at 1-800-994-2345 to learn more. You'll get the expertise and discipline you need, without the attitude.



Visit our web site: www.vanstar.com/nostarch

BRIDGE THE GAP
BETWEEN
MICROSOFT WINDOWS
AND ANY
UNIX SERVER.



MAKE SCO® YOUR WINDOWS® TO UNIX®
SYSTEM CONNECTION WITH SCO XYSION™

The world's leading supplier of UNIX servers now offers the ideal transparent PC X Server for Microsoft® Windows. It's called SCO XVISION, and it's a member of the powerful SCO Vision Family of Windows to UNIX products which makes the power of UNIX applications and data transparently accessible from your Microsoft Windows desktop. Over almost any network.

SCO XVISION

- Supports HP-UX, SunOS, Sun Solaris, IBM AIX, SCO OpenServer, SCO UnixWare and many more
- Supports Microsoft Windows 3.1, Windows 95 and Windows NT
- Includes the latest Microsoft TCP/IP stack, and support for 18 others.

THE TRANSPARENT PC X SERVER

The unique XVision subsystem provides instant and transparent access to UNIX-based X applications, which means you no longer need to start your PC X Server to access your application. Just point and click. Using the latest Microsoft Windows programming standards, the XVision file manager extends the Windows File Manager technology into the UNIX server to provide instant point and click access to business critical applications. It's that easy.

ADVANCED PERFORMANCE.

Designed to take full advantage of today's 32-bit hardware architecture, SCO

XVision delivers complete Windows 95 compatibility. It will even automatically configure itself to your individual PC and network upon installation for maximum performance.

It's the most powerful way to bridge the gap between Windows and your UNIX applications.

**CALL NOW AND RECEIVE YOUR FREE
SCO VISION FAMILY EVALUATION CD***

I-888-SCO-4YOU
www.sco.com/ad/xvq496



*KOD includes 30 day maximum supply of KOD 30/30, KOD Super/Max, KOD 30/30, and KOD 30/30. KOD is a trademark of The Santa Cruz Operation, Inc. in the USA and other countries. Whose is a trademark of Whose Limited, a subsidiary of The Santa Cruz Operation, Inc. UNH is a registered trademark in the United States and other countries. Unh is a trademark of Unh Company Limited. All other brand and product names are or may be trademarks of, and are used to identify products or services of their respective owners. The Santa Cruz Operation, Inc. reserves the right to change or modify any of the product or service specifications or features described herein without notice. The warranty is for informational only. KOD does not assume or implied representations or warranties in this warranty. © 1996 The Santa Cruz Operation, Inc. All Rights Reserved.



Review: OpenDoc
shapes up as worthy
platform, 54

Software

Notes to survive Web foes

By Tim Ouellette

Users are starting to get their hands on World Wide Web-based collaboration products that offer alternatives to the likes of Lotus Notes. But don't expect Notes to go the way of the dodo bird as a result.

"None of the so-called Notes killers on the market have the Lotus approach," said Ed Fredkin, president of Radnet, Inc., a manufacturer of Web-based groupware. Lotus Development Corp.'s idea for groupware

— an application development platform that can be customized and has strong, built-in administration and security — is a good framework for some sites, he said. But others may need something simpler.

Web-based products such as Radnet's WebShare may lack infrastructure, but they make up for it with ease of use, flexibility, and accessibility.

Groupware, page 52

By Michael Goldberg

Good old "batch processing" doesn't have the same splash-out-loud buzz today as all things Internet do, but many mainframe users say batch jobs are still among their most important tasks.

So System/390 users concerned about the growing demands on their resources — and the shrinking time available to process batch jobs — reacted hopefully to a new technology pact between IBM and BMC Software, Inc.

IBM plans to offer early next year software called SmartBatch. The product merges three technologies that IBM and Houston-based BMC have developed separately to bring massively parallel processing capabilities to System/390 batch jobs. By splitting batch jobs into smaller tasks that can be distributed to available parts of one mainframe — or to several mainframes connected in a Parallel Sysplex — the companies said they can speed up the work (see chart).

Pricing information for SmartBatch isn't available but will be when the product debuts in the first quarter of next year, IBM said.

Performing a batch job means processing a group of transactions at one time, such as the results from a day of banking activity or a week's insurance

Three for the road

Batch Accelerator splits a large data processing job into pieces and allocates them to different processing resources, depending on which resources are available.

BatchPipes allows data from one job to move through processor storage without going to connected storage devices.

Data Accelerator prepares information from the batch processing job that, depending on the application, will give access to the most-needed information first.

claims. The product of such a batch could show the bank customers' account balances or all the stock items needed from a mail-order company's warehouse.

At Epilon, Inc., a database marketing company in Burlington, Mass., with two IBM mainframes, the amount of batch processing data "is growing geometrical," said Larry Jones, vice president of information systems. This puts more pressure on his computing resources at a time when his customers want information turned around faster, he said.

Jones said his company, which uses IBM's BatchPipes to speed up some of its batch jobs, is evaluating SmartBatch and deciding whether to implement a Parallel Sysplex configuration. The concept behind SmartBatch is "excellent" regardless of a Parallel Sysplex setup, he said. "The amount of data is growing, and to get the work done, you need innovative ways of doing that," he added.

Analysts praised the IBM/BMC deal as one that advances the cause of batch processing, especially for large companies with around-the-clock demands on their information systems.

But SmartBatch isn't a panacea. It requires that batch processing jobs be split into components to be most effective, said David Floyer, a research director at International Data Corp. in Framingham, Mass. SmartBatch is valuable for lots of batch jobs but not everyone, he said. For example, SmartBatch wouldn't be good for a "piggyback" batch job that isn't suited to distributing the work, Floyer said.

Ed Carr, a Philadelphia-based analyst at Aberdeen Group, Inc., said SmartBatch should help mainframe users improve the productivity of their processors in batch jobs, especially as more users implement Parallel Sysplex. "If you have 16 processors, unless you have a product like this to do load balancing, you might have two or three working and the rest sitting there idle," Carr said.

Vendors tailor their PC-to-Unix links to intranets

By Craig Stedman

Makers of software that lets PC users run Unix applications are rushing to catch the intranet express.

Network Computing Devices, Inc. (NCD) and Hammingbird Communications Ltd. earlier this month enabled their rival PC X servers to launch Internet-based Unix programs from within World Wide Web browsers.

This initial support is a prelude to the planned shipment next year of PC X products that will embrace an upcoming Internet version of the industry-standard X Window System protocol.

Future support is also planned for centrally configuring PC-to-Unix links from a Web browser, instead of having to do it user by user.

Several systems administrators who manage PC X server installations said that capability and the support for using Web browsers as a launchpad for X applications could make life easier for users.

"We certainly" are putting a lot of applications on our intranet, and I think there's a good likelihood that we

could go somewhere with this," said Stan Weber, network manager at Chevron Canada Resources.

sources, a Calgary-based oil production and exploration arm of Chevron Corp. in San

Ramon, Calif. The 120 users of NCD's PC-Xware software at X Windows, page 50



X Windows

CONTINUED FROM PAGE 49

the Chevron unit currently have to start X Window sessions on their PCs and manually enter commands to run Unix applications on remote hosts, Weber said. Embedding the Unix programs as hot links within an intranet Web page would remove that

burden and provide a quick and easy way to get at Unix data, he said.

"It would make our interface friendlier, since a user wouldn't have to learn all the different commands and icons," said John Cerro, a technical specialist at AT&T Corp.'s information technology services operation in Piscataway, N.J. AT&T uses Hummingbird's Exceed software on 3,000 PCs.

But there are some initial limitations.

Neither PC-ware nor Exceed can work through firewalls, which limits their use to intranet intranets. Once launched, Unix applications also would have to run separately from a browser in their own X windows. And PC X software is notoriously bandwidth-hungry, which turns off some users.

The X protocol "really requires a lot of bandwidth to blow stuff across to your screen and show the pictures," said Pat Patterson, desktop support manager at a U.S.

telecommunications company. "We use X all the time here, and we're big on Web browsers. But I'd be hesitant to combine the two technologies until the performance was a little greater."

These limitations are supposed to be addressed by Broadway, the next version of the X Window standard that is due to be released to vendors late this year. Two key pieces are firewall support and a low-bandwidth option that supports speeds of less than 10M byte/sec.

One caveat, though, is that the X Consortium, which is developing Broadway, plans to wind down its operations by year's end and hand off X Window ownership to The Open Group in Cambridge, Mass.

The X Consortium still promises to deliver Broadway as planned, but the impending takeover "has raised more questions than there were before," said Clive Frost, marketing director at NCD's software unit in Beaverton, Ore.

Custom Publications

The Computerworld Custom Publications Program

Your Technology Solution Showcase

"Computerworld's Custom Publications Program helped us successfully communicate Novell's key business messages to the right audience."

"As a media and marketing communications agency, The Martha Felt Group is always looking for innovative ways to meet our clients' communications needs. To best help Novell tell the world about its products and services, we decided an insert would offer the best advertising real estate for the money.

And we were right. Computerworld's Custom Publications Program gave us the flexibility to craft and distribute a publication that was both informative and insightful. Computerworld took care of all the details and provided us with an appropriate media vehicle that focused on our client's target audience.

In addition, this publication was successful in highlighting the contributions of Novell's partners in helping Novell deliver complete solutions to customers.

And talk about marketing muscle. Novell and its partners are using the publication for direct mail purposes, in sales kits, and as an effective marketing tool at various trade shows and events.

If our client is happy, we're happy. With Computerworld's Custom Publications Program, everybody wins."

Carrie Gaydosinski
Senior Director
Marketing/Communications Services
The Martha Felt Group



New Products

Micro Logic Corp. has introduced Disk Mapper, a software utility.

According to the Hackensack, N.J., company, DiskMapper graphically maps out the information on a hard disk, which lets users delete or compress files they rarely use. It gives users an overview of the hard disk and lets them zoom in and out of subdirectories. It lists the size of every file and subdirectory.

DiskMapper costs \$50.

Micro Logic
(202) 342-6518
www.mlogic.com

Millennium System Products, Inc. and Orion Network Solutions Ltd. have announced Orion 3.2 an electronic-mail product for IBM AS/400 systems.

According to the Naples, Fla., company, Orion 3.2 features an Item Control subsystem that lets each installation track activity by item number, originating and destination mailbox location, creation and delivery transmission time and status. Its Delegate Mail function lets users specify that all mail be forwarded to a designated address.

Pricing starts at \$2,000 for 10 mailboxes. Multisystem discounts are available.

Millennium System Products
(941) 566-3033

Institute of Advanced Development Strategies, Inc. has introduced PDS-Mover.

According to the Aliso Viejo, Calif., company, PDSMover lets users transport program executable libraries between IBM VMS systems that use PC media, including floppy disks and CD-ROMs.

The product has two parts: PDSMover Server and PDSMover Client. The server creates file images, which can be transferred through PC media. It costs \$975. The client converts those file images to their original form. It costs \$25.

Institute of Advanced Development
Strategies
(714) 448-9578

For more information, please contact Carolyn Madeiros, Publishing Services Director, Boston 1-800-343-4474

THE

BUILDERS

**WHY ARE FOCUS SIX REPORTING SYSTEMS
"THREE-TIERS" ABOVE THE COMPETITION?
CALL THE BUILDERS.**

SUPERIOR POWER FOR COMPLEX REPORTING AND ANALYSIS

What makes FOCUS Six for Windows reporting and analysis systems so much better than the competition? Well for one, it's the power of FOCUS. Unlike those other SQL wrap-around tools, FOCUS was invented for reporting and analysis. Even the most complex queries with conditional fields, rankings, "if-then-else logic," multidimensional analysis...the kind of reports that can bring an SQL reporting tool to its knees...are just a few point and clicks in FOCUS Six.

THREE-TIER ARCHITECTURE FOR REMARKABLE PERFORMANCE

But the superior reporting and analysis of FOCUS Six is only half the story. You see, all FOCUS Six Reporting systems

feature our unique, three-tier client/server architecture that dynamically partitions all queries on the fly. This guarantees that all the complex numbers crunching and aggregation takes place on your server (mainframe, midrange, or LAN server). Only information comes down to your PC...not millions of rows of data. And that means a more efficient network and a remarkable improvement in performance. FOCUS Six makes high-volume client/server reporting systems a reality!

CALL THE BUILDERS

For more information on our complete suite of FOCUS Six reporting and analysis systems, including our limited-time offer on our "Three-Tier Reporting Pak", call "The Builders" at 800-969-INFO.

800-969-INFO
In Canada Call 416-364-2746



**Information
Builders**

FOCUS is a trademark of Information Builders Inc., NY NY 212-736-4653 e-mail info@ibd.com WWW: http://www.ibd.com

Software

Groupware

CONTINUED FROM PAGE 49

WebShare and other such products (see chart) let businesses host groupware applications—for discussion forums, purchase order processing or sales lead management, for example—on Web servers. They let users access these applications via Web

browsers. There is still a lot of ground to cover and real-world experience to gain with these Web-based products before users can tell whether they cut the mustard, analysts said. But users are beginning to see some initial success. For example, Simoa & Schuster, Inc. in Parsippany, N.J., uses WebShare to provide sales report updates to its 1,200-person sales organization. It also plans to let its 6,500 intranet users access WebShare applications. Robert

Blau, director of Internet architecture and application development at Simon & Schuster, said WebShare's application development environment—which is lacking in many Internet groupware packages—its access control to applications and documents and its ability to attach files to documents played a part in the company's decision to use the product.

Input, a research firm in Mountain View, Calif., predicts that by 2000, users of Inter-

Sample of Web-based groupware packages

Vendor Product	Description
	Full Web-based groupware environment
	Web-based discussion forms
	Web-based simple project management for workgroups
	Suite of groupware applications distributed by online service providers

net-based groupware will overtake Notes users, 32 million to 26 million. The number of applications available for these products from third-party developers will be the key if Internet groupware vendors' hope to reach these lofty expectations, said Brad Meinert, an analyst at Input.

Radnet is trying to establish channel relationships with the most readily available developer base: the thousands of Notes developers Lotus has built up over time.

One such firm, Synetics Corp., in Wakefield, Mass., plans to add WebShare to its line of groupware alternatives but continue its business with Notes.

"WebShare provides groupware that doesn't really rely on infrastructure; it's certainly a definite need in the industry for something like that," said Bahar Uzman, president of Synetics. But Notes will still be needed in other situations, he said.

A Brilliant Deduction™



Searching for a way to round out your corporate giving—with a program that earns tax deductions of up to twice cost? Discover product giving through Gifts In Kind America.™ Our free donation management services make it easy for companies to donate inventories of everything from computers to clothing, high chairs to hardware...helping worthy charities nationwide and around the globe. Let us help you explore a giving program that can benefit your company's bottom line...while opening up a whole new world for others.

Product giving — the perfect solution!

For more information on how your company can get involved, contact:



**GIFTS IN KIND
AMERICA**

700 N. Fairfax Street
Suite 300
Alexandria, VA
22314

703-836-2121

Christopher Columbus, Explorer, 1451-1506

©1994 Gifts In Kind America

Gifts In Kind America...for more than a decade, helping hundreds of leading companies contribute half a billion dollars in products to tens of thousands of charities.

Brief

Comet landing delayed

With its focus more on UnixWare, SCO, Inc. has postponed plans to revamp its low-end OpenServer operating system. Initial pieces of a promised new version, code-named Comet, were recently introduced as an add-on to OpenServer 5.0. But features such as built-in support for Java and increased memory capabilities will be released in a series of updates through the end of the year, SCO officials said.

CareerWorld

WE'RE HIRING PROFESSIONALS
EMPLOYMENT
ON THE GO
WWW.CAREERWORLD.COM

Groupware

CONTINUED FROM PAGE 49

WebShare and other such products (see chart) let businesses host groupware applications—for discussion forums, purchase order processing or sales lead management, for example—on Web servers. They let users access these applications via Web

browsers. There is still a lot of ground to cover and real-world experience to gain with these Web-based products before users can tell whether they cut the mustard, analysts said. But users are beginning to see some initial success. For example, Simon & Schuster, Inc. in Parsippany, N.J., uses WebShare to provide sales report updates to its 1,200-person sales organization. It also plans to let its 6,500 internet users access WebShare applications. Robert

Blau, director of Internet architecture and application development at Simon & Schuster, said WebShare's application development environment—which is lacking in many Internet groupware packages—its access control to applications and documents and its ability to attach files to documents played a part in the company's decision to use the product. Laput, a research firm in Mountain View, Calif., predicts that by 2000, users of Inter-

Sample of Web-based groupware packages

Product	Manufacturer
WebShare	Lotus
WebShare	Lotus
WebShare	Lotus
WebShare	Lotus
WebShare	Lotus
WebShare	Lotus
WebShare	Lotus
WebShare	Lotus

A Brilliant Deduction™



Searching for a way to round out your corporate giving—with a program that earns tax deductions of up to twice cost? Discover product giving through Gifts In Kind America.* Our free donation management services make it easy for companies to donate inventories of everything from computers to clothing, highchairs to hardware...helping worthy charities nationwide and around the globe. Let us help you explore a giving program that can benefit your company's bottom line...while opening up a whole new world for others.

Product giving — the perfect solution!

For more information on how your company can get involved, contact:


GIFTS IN KIND
 AMERICA
 700 N. Fairfax Street
 Suite 300
 Alexandria, VA
 22314
 703-836-2121

Christopher Columbus, Explorer, 1451-1506.

©1994 Gifts In Kind America

Gifts In Kind America...for more than a decade, helping hundreds of leading companies contribute half a billion dollars in products to tens of thousands of charities.

net-based groupware will overtake Notes users, 32 million to 26 million. The number of applications available for those products from third-party developers will be the key if Internet groupware vendors hope to reach these lofty expectations, said Brad Melcher, an analyst at Input.

Radnet is trying to establish channel relationships with the most readily available developers: Lotus has built up over time.

One such firm, Synetics Corp. in Wakefield, Mass., plans to add WebShare to its list of groupware alternatives but continue its business with Notes.

"WebShare provides groupware that doesn't really rely on infrastructure; it certainly is a definite need in the industry for something like that," said Bahar Uttam, president of Synetics. But Notes will still be needed in other situations, he said.

Brief

Convent handling delayed. With its focus more on UnixWare, SCO, Inc. has postponed plans to re-vamp its low-end OpenServer operating system. Initial pieces of a proposed supervisor, code-named Convent, were recently introduced as an add-on to OpenServer 5.0. But features such as built-in support for Java and increased memory capabilities will be released in a series of updates through the end of the year, SCO officials said.



THE

BUILDERS

I want to learn how to build a data warehouse that offers quick results. Please send me:

- ☐ A FREE copy of "Blueprint for Building a Data Warehouse...A Proven Approach for Rapid ROI"
- ☐ A FREE copy of "Architecting the Data Warehouse."
- ☐ I'm interested in a FREE consultation with a Senior Data Warehouse Consultant.

We are planning to begin a data warehouse project in:

☐ 1-3 months ☐ 3-6 months ☐ 6-12 months

A Project Budget has already been allocated:

☐ Yes ☐ No

NAME _____

TITLE/JOBT _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____

**Information
Builders**
CALL 800-969-INFO
In Canada call 416-364-3744

E-mail: info@ibuild.com WWW: http://www.ibuild.com

CM722266



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1305 NEW YORK, NY

POSTAGE WILL BE PAID BY ADDRESSEE



ATTN: Product Information Center
Information Builders
P.O. Box 1461
New York, NY 10117-1484



THE

BUILDERS

**HOW DO YOU BUILD
A DATA WAREHOUSE IN 90 DAYS?
CALL THE BUILDERS.**

Grand Opening

No other company in the world can match Information Builders' experience in accessing, migrating, and analyzing data within a multi-platform environment. That's why we've been able to develop the methodology, tools and integration services to make your data warehouse project a rapid success.

We'll help you build your data warehouse in manageable stages that provide demonstrable payback in as little as 90 days. Our proven "prototyping techniques" let you learn as you go to avoid costly mistakes. And our full line of data

access, data migration, and reporting tools guarantee that your data will be transformed into useful, intelligent information faster than you ever thought possible.

So why wait years for uncertain results when you can start enjoying real benefits in just a few months. Call "The Builders" today at 1-800-969-INFO for a copy of our *Blueprint for Building a Data Warehouse...A Proven Approach for Rapid ROI*. We can even arrange a free telephone consultation with one of our Senior Data Warehouse Consultants.

**Information
Builders**

800-969-INFO

In Canada Call 416-364-2746

IBM is a trademark of International Business Machines Corporation. ©1997 Information Builders, Inc. NYC NY 212-736-4033 E-mail: info@ibm.com WWW: http://www.ibm.com

The beauty of our
Web-deployable software is that you can install
100 different sites in 5 minutes.

(But that'll be our little secret.)

© 1999 Lawson Software

LAWSON INSIGHT™, the world's first Web-

deployable business management system, can be up and

running throughout your organization with one installation — no matter how

many sites or hardware platforms are involved. Any workstation with a Web browser can access

it, without sacrificing functionality. And new sites can be added simply by adding browser software. Plus,

LAWSON INSIGHT supports Activity-Based Management, delivering process-driven integrated, cross-functional solutions

through financials, human resources, procurement and supply chain process suites. LAWSON INSIGHT. *Because the future can't wait.*



"Funny,
I thought my
job description
said
MIS manager
not

test pilot."

HELP

Uh-oh. It's time to start designing a client/server network. All in the line of duty, of course. The trick is to do it somehow without risking your life.

The problem can be summed up in a few words. Words like "danger." And "why me?"

Wouldn't it be nice if you could see exactly how things were going to work before rocketing headlong into a sky full of question marks?

That's what we thought.

At IBM, we've spent years helping a wide variety of companies find an even wider variety of client/server solutions. Recently, we took what we've learned over those years, the accumulated wealth of knowledge, solutions, ideas, inspirations and innovations, and published them on a Lotus Notes® database.

We call it the IBM Client/Server Advisor System™, and it puts a vast reservoir of knowledge within easy reach. So whether you have to design

a system for sales and marketing, human resources, manufacturing or finance, you can start from a point of knowledge and experience.

Together, we can devise a solution for your business by looking at the ways in which other businesses satisfied similar needs.

Of course, simply having a solution isn't exactly the same as having a solution that works for you. So we created Open Systems Centers (there are 42 of them around the world). There, we can get more specific, design a tailored solution and test it in a real-life multivendor environment. So you'll see just how it will work in your company.

All of which means you can spend less time worrying about the risks and start focusing on the opportunities. To find out more, visit www.ibm.com or call 1 800 IBM-7090, ext. C130, for a free 16-page booklet.

Then sigh with relief.

Solutions for a small planet™

IBM



Firm enhances
NetWare file server
crash utility, 64

The Enterprise Network

The Enterprise Network

Firm sings Sonet praise

By Kim Girard

A tug-of-war can break out among physicians at a United Health-affiliated technician takes a patient's X ray. The primary care physician wants it. So do the specialist and the radiologist. "The issue is access to the information," said Doug Mard, a United Health physician at the Family Doctors clinic in Kimberley, Wis. "A lot of the clinicians want to see the image themselves and make their own judgment." Soon, health care providers on United Health's network will be able to share patient records and images

via Asynchronous Transfer Mode (ATM) packet switching technology over a Synchronous Optical Network (Sonet) ring.

The bidirectional Sonet network enhances United Health's private-line services and offers increased network reliability, redundancy and restoration capabilities for voice, video and data.

Rick Robide, United Health's network administrator, said no other technology rivals Sonet's ability to automatically detect breaks in fiber lines and reroute traffic in 50 milliseconds to maintain a continuous link.

"If there's a cut on a link, the network is smart enough to say, 'I know where my backup is,'" said Tom Jenkins, a broadband consultant at TeleChoice, Inc. in

Verona, N.J. The Sonet ring connects United Health headquarters to its two hospitals: Appleton Medical Center in Appleton, Wis., and Theda Clark Medical Center in Wausau, Wis. About 20 physicians' offices throughout northeast Wisconsin are also linked to the network via Integrated Services Digital Network (ISDN) and frame relay.

Cost factors

United Health pays Ameritech Corp. about \$13,000 per month for the tariffed Sonet service. That cost is about equal to what it paid for ISDN, frame relay, T1 and voice channels that ride on the Sonet, Robide said. "There was no monthly increase to move to Sonet," he said. The only cost for the migration was in pay for routers and other ATM-enabled equipment, he said.

Sonet also helped soften the impact of a recent file server upgrade to Novell, Inc.'s NetWare 4.1 and a large increase in the number of PCs at its three main sites.

Rmon standard stepping up

New spec provides application-level info across segments

By Patrick Dryden

An impending standard for monitoring application traffic across client/server networks should help administrators maintain vital business functions, not just connections.

A brand-new form of the Remote Monitoring (Rmon) specification

is expected to significantly expand the ability of network managers to watch the performance of their networks.

Rmon remains a valuable spot trouble-shooting tool, but Rmon 2 will let managers track overall network service.

The original Rmon standard, now supported by every inter-networking and management vendor, helps collect and analyze basic traffic flow through individual network segments.

Rmon 2 can show activity by applications and between clients and servers across multiple segments of the network.

With Rmon switching utilization in our switch-

Network monitoring

es, we know immediately if problems pop up. Rmon 2 would help us sort out contention to see who's monopolizing the pipe," said Jim Ryan, network planner at the University of Massachusetts Medical Center in Worcester, Mass.

Ron Wolf, senior technical lead in the network performance and capacity planning group at Charles Schwab & Co. in San Francisco, said current Rmon tools can deliver good information on overall resource usage.

"But we don't know what's driving the use of an application-level data will help us understand all the pieces," he said.

"Rmon 2 is part of the trend toward making data networks more of a utility, like a telephone network," said Michael Howard, president of Ionetics Research, Inc. in San Jose, Calif.

"Network managers want to spend more time managing usage, not plumbing. Rmon 2 is a major step," Howard said.

Standardization needed

The market for Rmon products blossomed last year to \$305 million, outstripping network management platforms at \$187 million and element-level management tools at \$155 million, according to International Data Corp. in Framingham, Mass.

Rmon vendors such as Concord Communications, Inc., Frontier Software Development, Inc., and Hewlett-Packard Co. extended the original technology in their own ways to let users monitor traffic at the network and application layers.

Such proprietary tools have helped several organizations already. Standardization of Rmon 2 will open the technology to many more that need it.

Standard data formats and collection methods offer assurance that users won't have to change home-grown management applications and also reduce the impact if one vendor goes away, Wolf said.

Some government clients of Network Performance Corp. put off evaluating the new Rmon until

Rmon standard, page 61

Synchronous Optical Network (Sonet)

A set of standards for transmitting data over fiber-optic cable at speeds of 5.18M bps/sec and faster.

A Sonet ring is for networks that have high traffic that requires huge amounts of bandwidth.

If you want T1 (6.3M bps/sec) or OC-3 (51M bps/sec) speeds, you may want to consider Sonet.

Increased network reliability and restoration capabilities down to the millisecond level.

"The traffic between campuses dramatically increased," Robide said. "We needed more bandwidth."

In the future, United Health can easily move from current T1 (6.3M bps/sec) lines to OC-3 (51M bps/sec), OC12 (800M bps/sec) or even higher-speed lines if necessary, without having to add extra equipment, Robide said. United Health will use ATM on the wide-area network July 27, replacing bridges with Cisco Systems, Inc. routers and ATM switches that will interface on the Sonet.

The network at first will be used for voice traffic and to transfer patient and administrative records. Later, magnetic resonance images (MRI) also will move on the network. So, a physician at Theda Clark and a specialist at Appleton Medical 9 miles away will be able to use MRI equipment to simultaneously view an image, which will cut diagnosis time, Robide said.

ATM applications haven't evolved enough to bring the technology to the desktop, but Robide said United Health will be prepared if they do.

"We see this [upgrade] as taking us into the year 2000 easily without having to do a major upgrade to that piece of our network," he said.

(www.computerworld.com) July 22, 1996 COMPUTERWORLD

Become Internet Engineering Task Force draft standard in December 1996

Provides information about traffic on one segment of the physical and data link levels

Shows current or historical statistics such as utilization or errors and enables remote protocol analysis

Should reach draft-standard status this month

Provides information about traffic beyond router barriers at the network and application levels

Shows client/server activity by application type across the network



IBM's OS/2 Warp Server 4.0

Four IS managers love improved installation, administration and add-ons.

By Kevin Burden

To know IBM's OS/2 Warp Server is to love it. At least that is what four users indicated in recent interviews with *Computerworld*.

Why are they so satisfied? Mostly, they said, because Warp Server 4.0 is easier to install than its predecessor.

LAN Server. Administration is as simple as drag and drop, and many of LAN Server's add-in products, such as SystemView, are integrated in one package. And the only crashes the users suffered were caused by hardware failures.

Still, nothing is perfect. Warp Server 4.0's file system doesn't support journaling, and its remote access program doesn't support Unix or Windows 95 clients. And, "it only runs on Intel platforms, and I really need a RISC-compatible version," one user said.

Computerworld interviewed four managers who have several months' experience with Warp Server 4.0. They rated the release, which went into general availability in May, on a five-point scale (A+ very good, B+ good, C average, D poor, E very poor). Their grades appear in the following order:

■ Bob Sanders, director of technical services at Rabbit Enterprises in Peabody, N.Y.

■ Josh Airlall, systems analyst at Cincinnati Bell Information Systems in Cincinnati.

■ John Robinson, systems manager at South Carolina Department of Parks and Recreation in Columbia, S.C.

■ Bill Howey, senior systems consultant at AVCO Financial Services Corp. in Irvine, Calif.

Installation



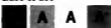
"Warp Server's installation is nothing like LAN Server's," Sanders said. That could be among the highest of compliments, judging from what the other evaluators had to say about LAN Server.

"LAN Server was installed in pieces and was never this seamless or easy," Robinson said. "Now you just answer about a dozen questions [in Warp Server 4.0], go to lunch, come back, and it's running."

But installation isn't foolproof. Warp Server 4.0 includes many drivers, but not everything users may need. The four users said all hardware was detected, but Warp Server 4.0 didn't always

configure it correctly. "It insisted on giving the wrong interrupt and no shared memory to one of our systems with an IBM Ethernet ISA adapter," said Sanders, who manually corrected the problem.

Ease of use



"The best thing Warp Server has done for me is take away all my TCP/IP headaches," Robinson said. Version 4.0 includes two utilities for managing TCP/IP: Dynamic Host Configuration Protocol (DHCP) and Dynamic Domain Name System (DDNS). Robinson configured his server using DHCP so it assigned TCP/IP addresses to systems as they boot up.

The DDNS associates IP addresses with corresponding English names, which lets remote users access any system, regardless of the IP address. "This way the DHCP client comes up on the network, sets its IP address, and we're off and running," Robinson said.

Utilities aside, Warp's object-oriented administration tops the reasons why OS/2 fansites consistently say Warp and Warp Server are easier to use than

Windows and Windows NT. "[If] you want to give 100 users access to a printer, [just] highlight them, then drag and drop them on to the printer's icon. It's that easy," Airlall said. He said he prefers to stay clear of NT's command-line administration. "You can also click the right mouse button on any object for a pop-up menu of options," Airlall said.

But Warp Server 4.0 doesn't include Network File Server or X Windows System. "It would be a lot easier for our Unix people if they were included," Sanders said. X Windows is the standard Unix graphical user interface.

The users interviewed are also looking for changes in the Microsoft Corp.-written high-performance file system (HPFS). Some want it packed because it is from Microsoft; others want it replaced with a journaling file system (see "IBM responds" below).

Network and systems management

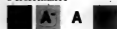


The real jewels of Version 4.0 are the newly integrated products such as OS/2 Warp 3, LAN Distance for remote access

and SystemView for systems management — previously all separate add-ons.

SystemView's scheduler flawlessly ran software inventory and distribution utilities and system backups after hours, according to the evaluators. "Best of all, they're automated. You don't have to write scripts for these functions [as in LAN Server]," Robinson said.

Performance



"When you can hang as many as 1,000 clients off the [advanced edition server], it's hard to complain," Airlall said. "We've easily connected 800 users concurrently" when the server was used for print and file-sharing only. As an application server, concurrent-user counts top out at about 150 to 200. But Airlall claimed that with enough memory and the maximum eight Token Ring cards installed, he has successfully run 1,000 concurrent users. The basic edition supports about 120 clients, though Airlall said it can run 300 to 400.

Warp Server 4.0's multitasking capabilities "are smooth and time-slice very nicely," Sanders said. The lack of symmetrical multiprocessing (SMP) support disappointed a couple of evaluators. But IBM expects to offer a free SMP upgrade later this year.

"The one beef I have is with the CHKDSK program, which is still a 16-bit program," Robinson said. Until IBM writes a 32-bit version, "I have to keep drive volumes low so partitions are manageable" (see "IBM responds").

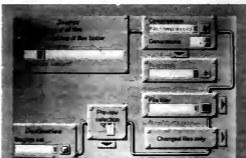
Reliability



"I wake up confident every morning knowing everything is going to be running," said Robinson, who blames his only server crash on a bad power supply.

This level of reliability, coupled with Warp Server's Safe O'Sound backup and recovery system, is why the evaluators reentry their critical applications to Warp Server 4.0. Airlall said his environment, which includes a variety of client-server operating systems, runs seamlessly. "As a client, you can't tell if you're talking to the Warp Server or the Novell server," he said. ■

Burden is *Computerworld*'s senior research editor. Scorecards/Firing Line.



IBM responds

Answers from Gary Hunt, IBM's technical lead for OS/2 Warp Server.

File System

"HPFS386 originated from Microsoft, but we haven't tested any code from them since 1990. We now have intellectual ownership of the technology. We are looking into journaling as a technology for Warp Server."

Clientset

"We realize walking through all the directory trees in a large partition can take a long time with the [16-bit] CHKDSK program. We are looking for ways to speed it up but don't have any data for changes."

NetWare crash utility enhanced

Vendor automates file server recovery

By Laura Didio

Alexander LAN, Inc. recently released a new version of its NetWare file server crash utility that automates the recovery process and restores server functions within minutes.

The Alexander LAN Server Protection Kit (SPK) 2.0 is a set of three applications that run on top of NetWare.

The applications were designed to "take the pain and guesswork out of what caused a NetWare file crash, locate the problem and fix it quickly," said Scott Penziner, head of technical support at Alexander LAN in Nashua, N.H.

Penziner said the Alexander LAN kit comprises the following three NetWare Loadable Modules (NLMs):

- The Emergency Diagnostics for the NetWare Administrator (EDNA), an automated server-based utility that gathers diagnostics and writes a crash file to record events.

EDNA can automatically reboot the NetWare server by running the Vrepair tool in NetWare.

- The Debugger Extender NLM, which extends the debugging capabilities of NetWare.

- The NetCheck NLM, a diagnostic tool that tracks the source of server crashes.

The three modules work together to prevent and recover from server crashes.

"Users who have anticipated the forthcoming Novell, Inc. Green

River release of NetWare, which also will have crash recovery capabilities, said the Alexander LAN SPK 2.0 will provide complementary functionality.

"I'm all for anything that's more effective than the 'homemade' server recovery utilities we've been using," said Wayne Stein, project manager at Electronic Data Systems Corp. in Warren, Mich.

Helpful diagnostics

Stein said the EDNA diagnostic utility could be particularly helpful because NetWare's is a complex, network operating system.

EDNs also lacks the on-site technical expertise to quickly locate the source of a server crash.

Marc Sayer, a network systems engineer at Heidelberg Harris, Inc., a manufacturer of printing presses, in Dover, N.H., said he is eager to investigate the utility because Heidelberg Harris' only method of crash recovery for its network of 35 NetWare file servers and 1,000 users is time-consuming manual repair.

"The Alexander LAN SPK can potentially give us all the pertinent information so we can go to our vendors armed with information and tell them what to fix," Sayer said.

"I also like the idea that we only have to drive one person to spend minutes [instead of one hour] to get us up and running." The product is shipping now and costs \$698.



EDN Wayne Stein: Alexander LAN's SPK 2.0 offers his firm an extra measure of protection

Briefs

No more network surprises

Instead of stuffing up to extend network management to nights and weekends, administrators can let NetSolve, Inc. take over. The company's new OS Hours Monitoring service complements daytime operations at organizations. The cost is \$7,500 per month for watching and fixing a wide-area network with at least 100 routers. NetSolve handles this part-time duty from the operations center at its headquarters in Austin, Texas, where it provides full-time management, called ProWatch TV, for smaller networks.

Secure SNMP for OpenView

By the end of this month, SNMP Research International, Inc. in Knoxville, Tenn., will offer network administrators a tool kit that brings security and remote configuration to the leading network management platform.

The SNMP Two-Star Security suite was developed by Hewlett-Packard Co. The product supports three versions of the Simple Network Management Protocol used with HP's OpenView Network Node Manager 4.1. The software, coming this month for \$2,995, adds two enhancements. It secures the exchange of network topology information that passes among distributed management servers, and it automates the security configuration process.

NetWare server automation

Startup Sleep in Seabrook, Inc. in Tucson, Ariz., recently released software that automates the management of NetWare 4.x servers from Novell,

Inc. The AutoAttendant module for Novell's Windows-based HWAdmin tool can schedule and execute any command that an administrator would routinely run at the server console. It works with Novell Directory Services and security and can control NetWare Loadable Modules. The price ranges from \$99 for one server to \$2,499 for 100 servers.

IBM in the middle

IBM has announced some long-promised additions to its MQSeries message-oriented middleware. But one key piece—a full implementation for Windows 3.1 and Windows 95—will wait until late September, as expected [CW, June 3]. The Windows release is central to IBM's plans for supporting mobile users with MQSeries. IBM also introduced a bridge that directly connects MQSeries to its IMS mainframe transaction software.

Wireless bridging

OTC Telecom, Inc. in San Jose, Calif., has released a wireless Ethernet bridge. AirWay Bridge delivers wireless data links at transmission speeds equal to T1 lines, over links separated by as much as two miles. OTC Telecom said the product is aimed at campus environments and large buildings and will make communications between buildings and floors possible without the high cost of laying cables. AirWay Bridge will cost \$3,500 and will support 64 users or more.

Tivoli to manage PowerBuilder

IBM's Tivoli systems management division plans to deliver an application management tool that fits in to PowerSoft Corp.'s PowerBuilder application development tools. The Tivoli Manager for Applications will be bundled with Power-

Builder 5.0, which is due later this month.

Life in the FastLane

FastLane Technologies, Inc.'s Final 5.0 network management utility recently released version 5.0 can run with Microsoft Corp.'s BackOffice suite of applications.

NetWare

Client 32 ships

Novell, Inc. recently started to ship its 32-bit requester software, NetWare Client 32 for DOS/Windows. The software gives 16-bit DOS and Windows 3.1 PC users full 32-bit access to all NetWare services, including Novell Directory Services. Businesses can also deploy the NetWare Client 32 requester to simultaneously access multiple file servers, printers and application resources. The software also includes the NetWare Application Launcher, a management utility that gives end users direct access to network applications. NetWare Client 32 for DOS/Windows is available now. Users can download the software for free from the NetWare 5.0 forums on CompuServe and from Novell's Web page.

HP releases new SNA hooks

Hewlett-Packard Co. has introduced new versions of its SNA connectivity products for linking HP 9000 Unix servers to IBM mainframes and AS/400s. The HP/UX SNAPlug line has expanded capability, a graphical user interface for systems administrators and support for IBM's Advanced Peer-to-Peer Networking implementation of SNA. This allows direct ties between different servers at a network. Prices start at \$3,550. HP also will integrate Cisco Systems, Inc.'s Vantage router technology into its SNA lineup.

Rmon standard stepping up

CONTINUED FROM PAGE 59

the standard was close enough for vendors to demonstrate compliance, said Andrew Jaworski, president of the consultancy in Dunkirk, Md.

More support

"Vendors have supplied many Rmon 2 capabilities with their private extensions, but now they will be under pressure to support all

of them," Jaworski said.

He said he hopes to see broad standardization among products that are currently proprietary. Then one vendor's software can configure other vendors' embedded agents and probe devices, and users will get broader control over the statistics they need.

Vendors said they plan to add Rmon 3 support through the rest of the year and test product interoperation in September.

New Products

Interphase Corp. has announced 5526 Fibre Channel Adapter.

According to the Dallas company, the adapter provides single-point connectivity from a Peripheral Component Interconnect slot.

It supports 100MB, 501MB and 800MB bit/sec. link speeds. Fibre Channel Class 1, 2 and 3 services; Fibre Channel Arbitrated Loop; Point-to-Point; and cross-switched

topologies. It also supports up to 16,384 concurrent SCSI I/O operations.

The product costs \$1,995. It comes with drivers for Windows NT and Novell, Inc. NetWare 4.x.

► **Interphase**
(214) 654-5000
www.interphase.com

Systems and Synchronous, Inc. has unveiled LANPartner Remote.

According to the Naperville, Ill. company, LANPartner Remote lets information systems

managers migrate older generation IBM-type controllers that use SNA or Binary Synchronous Communications (BSC) protocols to the LAN. It was designed for IS managers and network administrators who need SNA and BSC access via TCP/IP from small and regional offices.

LANPartner Remote supports a single PU.2.0 node with a maximum of 128 concurrent TN3270 sessions. Pricing starts at \$6,500.

► **Systems and Synchronous**
(708) 505-4517
www.sinc.com

**Unfortunately, we are prohibited
from informing you that reliable Acer
components are used by many of the
best-known computer companies.**

(Oops.)





Well, at least we can give you the name of one of the many companies using Acer® components in their computer systems: Acer. From our new line of AcerAltos™ 19000 servers and AcerPower™ 5000 Series desktops to the AcerNote™ Light notebooks, we make our own stuff as well as put it all together. So we can keep a close eye on quality. And make sure you're not ever caught waiting for product because, chances are, we're



not waiting for parts. More information? Call 1-800-551-ACER,

or visit our Web site at www.acer.com/aac/. We'll

tell you everything you want to know. Within limits.



Acer and the Acer logo are registered trademarks and AcerLink, AcerPower and AcerNote are trademarks of Acer America and Acer Inc. The Intel Inside Logo and Pentium are registered trademarks of Intel Corporation. Microsoft, Windows and Windows NT are trademarks and Windows NT is a trademark of Microsoft Corporation. All other brand/product names are trademarks or registered trademarks of their respective companies. ©1996 Acer America Corporation. All rights reserved. Specifications vary by model and configuration, and are subject to change without notice. Call for more information and details on Acer's Limited Product Warranty.



YOU'RE LOOKING AT HISTORY IN THE MAKING.

*Capturing an entire government agency's history was
no small task. Putting it on the Web was yet another.*

*But Fujitsu scanners, together with Adobe Acrobat®
software accomplished just that, in record time.*

¹ Creating a virtual agency for generations to come.

Utilizing Adobe's Portable Document Format (PDF),

*Fujitsu scanners enable you to do the same. Now
you can easily transform your most valuable, paper-
based information into flexible, fully-searchable
electronic documents that can be stored on Internet*

*or Intranet servers. So they can reside on the World
Wide Web. Or the corporate net. And be viewed*

or printed from any computer. Anytime. Anywhere.

Making them available to everyone. Everywhere.

Enabling you to create living legacies of your own.

*For the complete story on how Fujitsu scanners
can help you make your own place in history,
your next stop should be www.fcpa.com/new.pdf
Or call 800-414-4349.*



Fujitsu's powerful Enhancement Technology
optically dramatically improves image quality
and provides specialized features for
industry-specific applications.

FUJITSU

Templar 2.0 rings up sales over the 'net, 66



Olympics online

Chances are good that heavy traffic will shut you out of the official 1996 Centennial Olympic Games World Wide Web site (www.olympic.com) at least once. It happened to us last week, before the games even began. But breathe easy. Plenty of unofficial sites offer armchair Olympians a taste of the fun.

● Yahoo's Scoreboard (sports.yahoo.com/yahoo/scoreboard) posts regularly updated headlines on who is winning right. Plenty of other news outlets, including *The Boston Globe*, *The Chicago Tribune*, *The Washington Post*, *Life* magazine, *Sports Illustrated* and CNN, also offer event results.

● NBC Sports (www.nbc.com/sports/) has lots to choose from while you're waiting for headlines to roll in. Check out a roster of U.S. athletes and an online store at which to shop, shop, shop. Of course, there's a TV schedule, for your old-fashioned types. Play an E-mail trivia game for a chance at \$100 in Olympic paraphernalia.

● The *Atlanta Journal-Constitution*, along with two Web consulting firms, has a few neat tricks at www.ajc.com/games.com. Check out seating charts at the various venues and the frequent updates on traffic conditions in the city. Chat with fellow fans or fly through a virtual reality tour of the Olympic ring.

● It's no David Letterman-Monkey-Cam, but Park Cam Live (www.olympic.com/parkcam), hosted by AT&T Corp., offers live footage of the main competition venue downtown. Recorded video of the Olympic Village and other sites is also available.

● Go to www.olympicparis.com/ for information on female athletes from all countries competing in everything from archery to yachting. The site also has a section on the history of women in the Olympics.

● Finally, if you're in Atlanta and you're sweating, find out why at www.athletics.com/atlanta.html. The site, hosted by an allergy pill company, posts daily pollen count updates for Atlanta and nearby areas.

—Kim S. Nash

The Internet

By Kim S. Nash

Ever wonder what tardily things your users are up to online? A handful of utilities that will ship this summer may help information systems managers find out.

Whereas some tools can block access to certain Internet locations or services, a crop unveiled recently aims to help IS understand the ebb and flow of internal networks.

As users increasingly demand Internet-specific network monitoring tools, many vendors have rushed to build them. But that isn't necessarily good news, said Carl Lehman, an analyst at Meta Group, Inc. in Boston.

"It's hard to say which vendors are going to stick around and which will be overcome" by the competitive

New tools track how your users use the Internet

What are they up to?

crush, he said. Users should look hard at what kind of network traffic questions they want answered before buying "just anything," he said.

Tiswald Networking Technologies, Inc. in Toronto and Net.Genesis Corp. in Cambridge, Mass., hope to differentiate themselves with tools that demonstrate the specifics of World Wide Web use.

The Tiswald product tracks data such as which Web pages users access, the path they take to get there and how much electronic mail they send and receive. Tiswald's 599 Internet SnapShot, due next month, isn't a Big Brother tool, company officials said. It doesn't peek at the content of the data that users access but simply

Tools, page 66

Don't get caught in the Internet collapse

Charles Babcock

I'm a Metacrawler. Or is it a Metacrawl?

Bob Metcalfe, author of *JebWorld's From the Ether* column, has received a stream of e-mail and criticism for his prediction that the Internet will collapse sometime this year.

He first made his prognosis, in jest, last Dec. 4. It seemed clear to me he was just having fun, but his comment stirred up a storm of protest. Metcalfe then began repeating it regularly, jarring in-

creasing attention to the facts. After listening to the many explanations of why he is wrong, I think he's on to something.

The Internet was designed for the exchange of ideas and research. It's become a bulletin board for millions of individuals and organizations. New businesses plan to use it as the free interconnection for interstate banking and electronic commerce. And some individuals hope to substitute its service for their monthly phone charges.

The Internet can't take everything that's being thrown at it, so parts of it are going to give out under the strain. Internet pioneer Vinton Cerf is skept-

tical that his company, Internet backbone supplier MCI, will be able to expand capacity as quickly as needed beyond next March. He pegs the 'net's growth at 300% a year.

My Unix friends tell me they have heard these warnings before, and yet the 'net keeps growing. They tell me the 'net is self-governing. As traffic grows, the network slows and reroutes traffic to underutilized lines. Some users shift to off-peak hours. Bandwidth is then added to accommodate the new sites and people coming online.

This process works, up to a point. But somewhere down the road it will hit a simple routing problem. The traffic generated has to be directed around the 'net, even if carriers find lots of cheap fiber-optic bandwidth to carry it. The carriers will have to add a lot of routing power to keep up with 300% growth, and they'll have to add it in the right places. I don't think we have the mechanics in place to do this for a large, unplanned network.

I expect the Internet to sag, brown out, slow to intolerable response times and suffer spot outages. We Metacrawlers don't take Bob Metcalfe on the "collapse" stuff. He's the inventor of collision storms — well, actually, Metcalfe invented Ethernet, which has collision storms

— so he knows a message jam-up when he sees one coming.

A sagging Internet is bad for business. If your organization uses it as an extension of the corporate network, your Internet application server will be up and running, but response times could become unpredictable: Your service may not even be available when most customers want to access it.

After listening to the many explanations of why Metcalfe is wrong, I think he's on to something

Your competition uses the 'net, so you must also. But over the next 18 months, exactly how much time you will get to spend on the 'net with your customers is an open question.

The traffic issues will eventually get sorted out. But in the meantime, the Metacrawlers will be proved right.

Babcock is *Computerworld's* technical editor. His Internet address is charles_babcock@cw.com.

How EDI over the Internet works



Templar 2.0 rings up sales over the 'net

By Mitch Wagner

Premenos Corp. in Concord, Calif., this week will ship a version of its electronic data interchange (EDI) product designed to allow EDI transactions through a direct Internet connection.

Templar 2.0 was designed to give two or more companies links to one another's information infrastructure so they can swap purchase orders, invoices, health claims and other essential business information.

The first version of Templar, introduced last year, used electronic mail as a transport for EDI data. But Templar found Internet mail to be unsuitable for transferring large messages. The new version of the software includes support for direct TCP/IP connections between Templar and any Internet-connected system. It will also connect using Hypertext Transfer Protocol. It can create a flat file of EDI data for use with a third-party transportation mechanism to link with existing EDI applications.

A low-cost VAN

The Premenos product uses the Internet as an inexpensive replacement for private networks, also called value-added networks (VAN), over which most EDI con-

nections are made.

VAN vendors, including IBM's Advantage business unit and General Electric Information Services, can charge \$150 per hour or more. Premenos officials estimate the cost of an Internet connection to be \$1 per hour.

But EDI users might be reluctant to abandon VANs. Despite the expense, EDI users value the security, accountability and reliability VANs offer.



Templar 2.0 supports direct TCP/IP connections.

"One of the problems with the Internet is, if there's a problem, who do you call?" said Tom Mongoven, who heads up EDI services at Bumble Bee Seafoods, Inc. in San Diego. "If I send a document and it doesn't get somewhere, how do I trace that? If my partner is on a small Internet service provider, do I call my ISP? Do I call the partner?"

Nonetheless, Mongoven predicted the problems with EDI

over the Internet will be solved within a year.

Templar was also designed to function as a back end for World Wide Web sites to allow corporate users to keep track of online sales, billing and other functions.

"Cost is a big issue for us," said Sarah Steinberg, a software engineer at the Internet Shopping Network in Palo Alto, Calif., which sells consumer merchandise online at www.internet.net.

"It's pretty expensive to use a value-added network, and the Internet is virtually free." The shopping network processes sales through an AT&T Corp. VAN but plans to replace that arrangement with a Templar system.

But what seems cheap to EDI users might seem expensive to Internet users. The Premenos software costs \$19,990 for a server that would let a company connect with as many as 25 trading partners; clients for each trading partner would cost \$449 each. For 20 or fewer trading partners, the server version is \$6,990.

The Templar client/server software runs on Sun Microsystems, Inc.'s SPARC, Hewlett-Packard Co.'s 9000, IBM's RS/6000 and 16-bit Windows. A 32-bit Windows version for Windows NT is due later this year.

Inc. have struck a deal to add data reliability and security to Spider's World Wide Web desktop tools. Spider in Menlo Park, Calif., and Gradient in Marlboro, Mass., will integrate Spider's NetDynamics with

Gradient's WebCrusader server software, which is based on Open Group's Distributed Computing Environment. Gradient will sell the combination later this year. Pricing hasn't been set.

Books for aspiring Web publishers

► **Netscape & HTML Explorer**, by Urban A. LeJeune; Corbis Group Books, Scottsdale, Ariz.; 446 pages; \$39.99 (paperback)



This combination user's manual and programmer's guide is a bit of an odd duck

among the World Wide Web instructional books we have seen lately. Most seem to concentrate on how to build and maintain Web pages, but they virtually ignore the technology used to view them.

This guide, aimed at the Web power user, fills almost a third of its heavily illustrated pages with detailed instructions on high-level functions of Netscape Communications Corp.'s Navigator browser, including tips such as how to edit a Netscape file.

The instruction is useful, but, as the foreword acknowledges, new versions of Navigator hit the Web so frequently, no publication on paper can possibly keep up with all the latest features.

The rest is a fairly standard tutorial on Hypertext Markup Lan-

guage (HTML), Common Gateway Interface, Java and JavaScript with examples of code and a CD-ROM with Navigator plug-ins, images, audio clips and other goodies for your home page.

► **Beyond HTML**, by Richard Knapik; Osborne McGraw-Hill, New York; 497 pages; \$27.95 (paperback)



Beyond HTML is exactly what it says: a guide for webmasters who want to move be-

yond the standard tricks of the Web-building trade and into cyberspace.

It covers how to use Adobe Systems, Inc. Acrobat and other formats that could act as alternatives to HTML. Then it moves on to Java coding; Virtual Reality Modeling Language; three-dimensional programming and advanced multimedia technology, including Macromedia, Inc.'s Shockwave animation; and real-time audio and video-streaming technologies. — Kevin Figarty

Tools track Internet use

CONTINUED FROM PAGE 65

records how and when network resources are used.

One early user of SnapShot discovered things about his network he wouldn't otherwise have known.

When CallPro Canada, Inc. in Toronto gave 20 of its 68 employees Netscape Communications Corp. browsers six months ago, the voice processing firm saw its network slow down.

"We just assumed it was because people were out there browsing the Web, discovering all kinds of new information," said Frank Tensig, vice president of technology at CallPro.

Rather, the slowdown came when administrators downloaded file server content to local clients — work that was completely unrelated to the Internet.

SnapShot tracks each of the Web, file transfer protocol (FTP) sites and E-mail. Other products monitor only the Web's Hypertext Transfer Protocol.

NetGenesis, meanwhile, recently introduced a PC version of its Unix-based NetAnalysis 1.0

Internet eyes

What you want in software that watches Internet use

- ✓ Graphical user interface to shorten learning curve
- ✓ Ability to monitor FTP, Internet and intranet services other than the Web
- ✓ A bundled database to keep usage histories
- ✓ Customizable reports that let you set variables such as time, user and server
- ✓ Option to create charts and graphs based on collected data

Web management tool.

NetAnalysis Desktop Edition 1.1 can measure the number of hits to a site or individual page for any period of time and identify users by domain name. It comes with a PC-based database to keep usage histories.

The product is due late this month for Windows NT and Windows 95. It costs \$295 until Sept. 30, after which it costs \$495.

Brief

Enhanced Web tool

Gradient Technologies, Inc. and Spider Technologies,

The Internet

New Products

Hybrid Networks, Inc. has announced Hybrid Access System 2000, a wireless point-of-presence (POP) server.

According to the Cupertino, Calif., company, Hybrid Access System 2000 lets a network operator send data to a subscriber's computer at 10M bit/sec. via a one-way wireless system. Return channels can be run over Internet connections. In operation, the wireless POP server is centrally located in a computer room or networking hub connected to the Internet backbone. The server typically is linked through point-to-point microwave to the operator's various wireless transmitter locations.

Pricing for system configurations starts at \$50,000.

► **Hybrid Networks**
(408) 725-3250
www.hybrid.com

Performance Technology, a subsidiary of Bay Networks, Inc., has announced Instant Internet 3.1.

According to the San Antonio company, Instant Internet is an all-in-one-box LAN-based Internet access product that will let Novell, Inc. NetWare-equipped sites and branch offices connect to the Internet. It has a 32-bit Winsock that lets Windows 95 and NetWare clients run applications that include Netscape Communications Corp.'s Navigator, Microsoft Corp.'s Internet Explorer and Java.

Instant Internet lets administrators filter and control access to newsgroups and features incoming services access. It comes with built-in Serial Line Internet Protocol and Point-to-Point Protocol dial-up facilities or with built-in Integrated Services Digital Network. It supports external Internet protocol routers on dedicated, digital circuits and Ethernet, Arnet or Token Ring networks.

Pricing starts at \$3,495.
► **Performance Technology**
(210) 979-2000
www.perftech.com

Great Lakes Area Commercial Internet, Inc. has announced GLACI SecureServ.

According to the Milwaukee company, GLACI SecureServ is a World Wide Web server for Novell, Inc.'s NetWare platform that can encrypt. It was designed to help users transform NetWare file servers into a commercial-grade Web server.

GLACI SecureServ lets users manage server and network resources and can be used to manage user accounts, access directory service information, examine network and server performance statistics and manage print queues. It loads as a standard NetWare Loadable Module on NetWare operating system Versions 3.11, 3.12 or 4.x.

Pricing starts at \$975.
► **Great Lakes Area Commercial Internet**
(414) 475-6388
www.glaci.com

CrossComm Corp. has introduced CrossLAN Exchange.

According to the Marlboro, Mass., com-

pany, CrossLAN Exchange was designed to attach industrial-strength corporate intranets to a company's network infrastructure by letting users transparently add high-speed access to intranet servers while preserving the network.

CrossLAN Exchange provides access for users of Token Ring and Ethernet LANs and for remote users who are connected to the original network through wide-area networks or the Internet. It features sup-

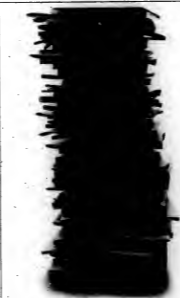
port for LAN emulation, virtual LANs, switched, virtual circuits, conventional and ATM routing, translation and adaptation services, high availability and reliability, firewalls and network management capabilities.

Pricing for CrossLAN Exchange starts at \$50,000.

► **CrossComm**
(508) 481-4060
www.crosscomm.com

Product short

WebVision, Inc. has announced that WebTropics PageScriber is available free at its World Wide Web page. PageScriber is a Server Side Includes and Hypertext Markup Language extension designed to increase the flexibility and control available to those who develop documents for the Web. WebVision, Torrance, Calif. (310) 790-4500. www.webvision.com.



It's NOT HOW MUCH
YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PCs, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 145,000 IS professionals pay to subscribe to *Computerworld*. Shouldn't you?



It's WHAT
YOU READ.

Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at 1-800-343-6474, or visit us on the World Wide Web at <http://www.computerworld.com>. To order by mail, use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems. And more time conquering it.

COMPUTERWORLD

Everything you need to know.

IBM's 5250 Emulation Family and your midrange network.



Everyone agrees nothing goes together better.

The idea of a perfectly compatible midrange network — where computers can easily and reliably share information — is what everyone is aiming for.

Thanks to the IBM 5250 Emulation Family, we're delivering on a promise of compatibility in connecting your PCs to midrange systems, like the AS/400, System/36 and System/38.

From the most simple connections to the most complex, the 5250 Family provides superior quality and compatibility to suit your evolving needs. As a result, any 5250 twinaxial solution you choose will grow with your business.

Better still, IBM's 5250 is a total solution of hardware and software that not only solves connectivity problems across your enterprise but also anticipates them before they occur.

No one else has IBM's product depth or proven support, which makes us an ideal choice for your midrange connectivity needs. To learn

more, call us today. We're your local IBM Distributor/Business Partner.

IBM's 5250 Emulation Family. Nothing brings it all together better.



Compatible with you.



1-800-727-7733



1-888-DBG-IBM



1-800-216-9666



1-800-423-2853

Pentagon offers software tools to the masses, 72

Corporate Strategies

Ticketless travelers

American Airlines software eases plane boarding

By Thomas Hoffman

As a financial consultant at Wells Fargo & Co., Dan Collins shuttles frequently between his Dallas office and his group's Houston base. Southwest Airlines, his company's carrier of choice between those hubs, allows him to travel without plane tickets. Collins merely shows his driver's license at the ticket counter and gets checked in.

But Collins still has to "pull out [his] ID and wait on line," and that annoys him. That is why Collins is receptive to American Airlines' forthcoming Access Boarding program, an automated boarding system that will let passengers skip long check-in lines, run a credit card through a card reader, show identification to a security agent and board an airplane. "That sounds a lot better," said Collins, who often flies American Airlines for leisure travel.

Officials at American Airlines said there are many travelers like Collins.

This September, the Fort Worth, Texas-based airline will roll out Access Boarding to its Top 23 domestic airports, which handle 80% of its U.S. traffic.

"This is the only ticketless boarding system that allows you to get on the plane," said John Samuel, director of distribution planning at American Airlines. Other carriers that offer ticketless travel, such as Southwest Airlines, "require you to stop at a ticket counter and say, 'Hi, I'm here.'"

Access Boarding, based on card-reader systems from IER in London. The card readers will be wired directly to an American Airlines workstation tied to the Sabre Computer Network.

Access Boarding is just one piece of American Airlines' Access program, a set of online reservations and ticketless travel systems in which the airline has invested more than \$10 million. Personal Access is a Windows-based

Ticketless travelers, page 72



American Airlines' John Samuel: The airline has already taken orders for 80,000 copies of its Personal Access software

Network makes toy maker's job a little more Kooshy

By Laura DiDio

Toy maker Oddzon Products, Inc. had a problem that most companies would envy.

Sales of the Campbell, Calif., company's kid-safe, soft rubber toys, such as the Koosh Ball and Vortex Football, were skyrocketing. The problem was, as sales rose, Oddzon's outmoded 10M bit/sec. Ethernet network bogged down under the strain of new employees who were added to support growing sales, distribution and manufacturing operations.

"We were experiencing

serious growing pains, and our users felt it keenly," said Andre Beantone, Oddzon's information systems manager. "We were constantly experiencing network freezes and crashes, and the wait time to access network applications and services—especially the printer—was way too long."

Oddzon's solution was to install a Cisco Systems Inc. 2800 Catalyst switch to replace the Intel network, page 73

Vendors turn on the tap of R/3 tools

By Julia King

Long and complex implementations have been a chronic problem for early users of SAP AG's R/3 client/server software.

But all of that is about to change as third-party vendors join SAP in delivering tools designed to streamline the process of getting R/3 systems up and running quickly.

ID5 Professor Scheer, a German company that sells project management and re-engineering software, next week will begin shipping an enhanced version of its Aris tool set. The software automates the process of mapping a company's business processes to SAP's best practices models and specific tables within the R/3 software.

SAP's R/3 comprises thousands of software tables that contain software-based switches that must be set on or off. Users can configure the software thousands of ways, depending on their business processes. How they set the switches dictates how the software runs.

It's automatic

With the Aris software, users no longer need to pore over R/3's tables. Instead, after they implement R/3, Aris automatically directs users to the appropriate R/3 tables.

"It captures all of your procedures and organizational structures that go along with the SAP software," said Brian Reinhardt, project manager at Akzo Nobel, a \$13 billion Dutch chemical company that has U.S. offices in Chicago.

Akzo Nobel is implementing a pilot R/3 system at its Chicago office and one U.S. plant. Because the business processes will already reside in Aris, Akzo Nobel can reuse them at other business units, Reinhardt said.

Also shipping is Live Model for R/3, a simulation tool from Intelliproc, Inc. In

Mountain View, Calif., that, among other things, lets users see how various R/3 configurations will execute once a system is in production. This makes it easier for developers to incorporate user feedback into the final R/3 configuration.

Trying on a new outfit

Deloitte & Touche's ICS unit in Chadds Ford, Pa., is outfitting its 1,800 R/3 consultants with laptop versions of the software. The firm is also linking its industry-specific best practices models into the software.



This "has the potential to cut double-digit percentage points out of the [R/3] design phase," said ES' CEO Alfred Gruenwald. The next, "and a much more dramatic step," will be automating the actual configuration of R/3's tables, he said.

"Right now, the Achilles' heel of SAP is the knowledge required to configure R," said Martin Roper, vice president of manufacturing and business development at Boston Beer Co., an R/3 site in Boston. "Tools that would let you define a process or transaction, then push a button and it would configure the tables, would be incredibly useful."

Gruenwald agreed. With such tools, "you could eliminate the majority of work. But this is probably one of two years away," he said.



Why you'll be happy that people are
surfing the net on company time.



**It's not the Internet. It's your new intranet,
where your users can share information better
than ever before.** All over the world, businesses like yours are
starting to build intranets to improve information flow within their
organizations, with customers and with partners. Intranets combine
the Internet's easy navigation with the power and productivity
of personal computing. So users not only have the ability to find
relevant company information more quickly and easily, they can also employ their desktop applications to
create, analyze and collaborate in new ways.

With the Microsoft® Office for Windows® 95 family of applications, you can get the most out
of your intranet. Because users can share information on your intranet using the Microsoft Office
applications they're using today. For instance, documents created in any Office application can
automatically be saved as HTML* for others to view in any web browser. Or users can post the
same documents in their native file formats to facilitate more flexible, in-depth analysis and
collaboration. Add the new Microsoft FrontPage® web authoring and management tool, and users
can easily create and update their own interactive, content-rich sites by simply clicking, dragging, and dropping.

So of course you'll be delighted to see users browsing and sharing information within your intranet.

It's just a sure sign that you've streamlined communications to help
people make smarter decisions and work better together. To learn
more about how Microsoft can help make your intranet as easy to
surf as the Internet, visit www.microsoft.com/intranet/

Microsoft

WHERE DO YOU WANT TO GO TODAY?



Pentagon offers tool set to masses

Analysis software helps groups decide which projects to fund

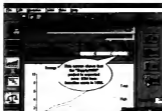
By Gary H. Aoshes

A software package for business processing re-engineering, inspired by the private sector and developed by the U.S. Department of Defense, is about to make its commercial debut.

TurboBPR is an integrated set of tools for business case development, strategic planning, operational cost and performance tracking and investment analysis. It was developed in 1994 by the Pentagon in an effort to fundamentally improve the way it decides which projects to fund.

Along the way, TurboBPR attracted the attention of other government entities, which were under increased pressure to provide better service to the public at lower cost. So far, about 10,000 copies of TurboBPR have been downloaded from the World Wide Web by federal, state, local and foreign government agencies.

Later this month, a version of TurboBPR (tailored for corporate use) will be released by SRA International, Inc. in Arlington, Va. Now called BitCase, it is based on Windows and costs \$285.



BitCase is an integrated tool set for business case development, strategic planning and cost tracking.

BitCase uses commercial terms, rather than government-orientedomenclature. It drops some Defense-specific functions

Many of the underlying concepts in TurboBPR and its progeny, BitCase, are based on the 1990 book *The Business Value of Computers* by Paul Strassmann. They use discounted cash flow projections, adjusted for risk, to rank investment alternatives.

TurboBPR and BitCase are written in Visual Basic and run on the desktop under Windows 3.1 or Windows 95. They comprise the following modules:

and adds a module for evaluating "implementation barriers and mitigation approaches."

TurboBPR designer Mike Yeomann, director of functional process improvement at the Pentagon, said conventional tools used by the government considered only the incremental, or marginal, costs and returns on investment alternatives. They might say, for example, to buy PCs rather than minicomputers because they are cheaper.

What was needed, Yeomann said, was a tool that would look at

total costs. For example, TurboBPR allows the analyst to extend the PC vs. minicomputer analysis by considering the future costs of providing the services those machines are intended to offer.

A special strength of TurboBPR is its ability to tightly link strategic plans, mission objectives, current costs and performance and the results of investment alternatives. "TurboBPR always leads the user back to why he is doing something, back to the objectives," said Peter Denega, a professor of systems management who uses Tur-

Yours free

TurboBPR is available for free at www.dtic.dia.mil/rj3/bprcd/. Click on "Computer Lab." A demonstration version of BitCase is available at www.sra.com.

boBPR at the National Defense University.

"Past tools tended to be fragmented," Denega said. "You could do a piece of this and a piece of that and then someone had to link them."

Federally funded, nonprofit Logistics Management Institute in Vienna, Va., used TurboBPR to help manage a series of projects aimed at reducing the costs of manufacturing and distributing uniforms. Donna Peterson, a research fellow, said it prompted managers to ask questions they hadn't formally considered before.

TurboBPR's strengths

- **Strategic planning.** Builds a structure linking goals, performance measures and strategies.
- **Implementation barriers and mitigation approaches** (BitCase only).
- **Operational analysis.** Provides insights into operations costs by product, service and customer.

- **Initiatives.** A spreadsheet tool for recording current and expected future project costs and performance.
- **Alternative analysis.** Compares the cost and performance of alternatives based on discounted cash flow and other techniques.
- **Actuals.** Monitors actual cost

and performance against projections.

According to Strassmann, a former CIO at the Defense Department and several major corporations, TurboBPR and BitCase address the issue of "alignment," which he said has "plagued CIOs for years." The software allows analysts to answer management questions about how investments contribute to profitability, he said.

—Gary H. Aoshes

Security issues lurk behind bank doors

By Network World Canada staff

Network security was far from perfect before its advent, but the Internet is making a difficult job even harder, according to banking vice presidents Donald Mark and Mark Dickelman.

Both spoke at the recent ComNet Canada Conference in Toronto.

"There is an underlying threat [in network computing]. The underlying threat is, we don't even know what it is any more. So how can you begin to secure it?" said Martin, vice president of corporate electronic banking services at the Bank of Montreal.

With the advent of the Internet, it is increasingly difficult to secure vital assets from outside forces, especially as much of the environment is out of a company's control, Martin said.

But he reminded his audience that the world outside the Internet is not without security risks. "We also have current-day systems that can be attacked and can

be defrauded, so what we do try to estimate how much we'll lose and compensate for it," he said, referring to fake checks, fraudulent credit cards, fictitious loans and the occasional bank hold-up.

He said hackers and their more malicious counterparts known as crackers are dangerous, but the real threat to network security is organized crime. Underworld hackers will systematically look for soft spots in a company's system and try to profit from the gap.

Take the right measures Dickelman, vice president of operating systems at the Harris Bank in Chicago, stressed the importance of implementing appropriate security technology.

The first law is the lack of a good security base on which to build, Dickelman said. Encryption is great, but it isn't the place to start, and implementing pass-

word protection is only as good as the control over password choice.

The implementation of a firewall, although increasingly important, is also a place where small points are missed. The most common firewall controls the flow of TCP/IP traffic in and out of a network, but applications such as telephone banking and electronic mail also require protection, Dickelman said.

"I think there is an increasing need for E-mail firewalls," he said, as on-line letter bombs and spoofing — where individuals identify themselves by false names or addresses — become more prevalent.

And new threats are still appearing, Dickelman said. For example, high-energy radio-frequency generators, called HERF guns, can damage computer data when deployed near installations, he said.

Ticketless travelers

CONTINUED FROM PAGE 69

software package consumers can use to book reservations and pay for tickets. Users can enter preferences for window or aisle seats and pay online with a credit card, phone the credit-card number to American Airlines or pay at the airport.

The software is free to American Airlines' Advantage Gold and Platinum frequent fliers. Others pay a \$6.95 handling fee.

American Airlines also has launched Access via the World Wide Web at its recently enhanced Web site (www.americanairlines.com). In addition to offering online flight reservations and purchases, the site contains links to Adventure and hotel partners, such as The Hertz Corp. and Hilton Hotels.

American Airlines rivals, such as USAir Group and UAL Corp.'s United Airlines, began marketing PC-based flight reservations soft-

ware to consumers last year. To date, those carriers are booking less than 10% of their reservations through direct electronic links with customers, said Mark Shields, a principal in the aviation practice at Mercer Management Consulting in Washington.

But Shields said he expects those figures to skyrocket as people get more accustomed to making purchases online.

That could spell doom for travel agencies, which historically have booked 75% of the airline industry's reservations, analysts said. Not surprisingly, nearly all of the consumer software being marketed by different airlines have varying degrees of bias. United Connections, for example, will show consumers all possible United Airlines routes before exposing them to other airlines' flights.

John Berger, owner of ABC Travel in Monroe, N.Y., said he, too, is skeptical. "What takes consumers a half hour to do on their PCs takes us two and a half minutes," he said. "We're connected to a wider market and can offer customers more competitive prices" than consumer software.



Network makes toy maker's job a little more Kooshy

CONTINUED FROM PAGE 69

Corp. 486-based, 50-MHz server and a 10Base-T Ethernet hub with Novell, Inc.'s NetWare 4.1.

"Oddzon chose the Catalyst 2800 switch — originally developed by recent Cisco acquisition Grand Junction Networks — because it offered the growing, but cost-conscious, firm a switching solution that didn't 'bankrupt our budget,'" Brantome said.

At about \$10,000 to \$12,000, the Cisco Catalyst 2800 was affordable. It also delivered the much-needed power of 100M bit/sec. Fast Ethernet capabilities on the backbone and 25 dedicated 10Base-T switched Ethernet ports for Oddzon's workstation users.

The Cisco switching device also handled NetWare's IPX and Apple Computer, Inc.'s AppleTalk protocols. And it delivered "out-of-the-box configuration and setup," Brantome said. "It was amazing to watch our collision problems and bandwidth utilization problems disappear."

Speed is of the essence

Lane Meadows, Oddzon's graphic design manager, said the difference between the old 10M bit/sec. Ethernet and the switching on the Cisco Catalyst was "like night and day" for the Macintosh-based graphics department.

Oddzon Products

A subsidiary of Russ Hille and Co.
Campbell, Calif.



Because the graphics department used the network to store many high-resolution graphics files, its networking problems — including collisions and freezes — were exacerbated.

"It took 15 or 20 minutes to transmit files and mechanicals using the AppleTalk protocols. The Catalyst Ethernet switch lets us transmit 15M-byte files in five minutes or less," Meadows said.

Much to the relief of his colleagues in other departments, the network has also slashed the time it takes graphics designers to complete a print job.

"The network was so slow that every time we needed to print a high-resolution mechanical, we'd bog the printer for 30 minutes or more. Since the Catalyst switch was installed, the problem has been elimi-

nated," Meadows said.

NetWare 4.1 with Novell Directory Services provided the toy maker with a scalable directory services database that allowed end users to access information anywhere on the network using a single log-on.

NetWare 4.1 also allowed Brantome to

make moves, add or changes to the network from his central network management console and to "troubleshoot any problems that crop up at our distribution facility eight miles away."

The company also plans to add a Microsoft Corp. Windows NT Server network to

help Oddzon's engineering department accommodate large computer-aided design modeling applications.

"Additionally, Oddzon expects to add a high-end Cisco Catalyst 5000 switch in the near future to accommodate the 50 to 100 users the company will hire in the next 12 to 18 months.



The Internet Commerce Expo

September 9-12, 1996, Anaheim Convention Center, Anaheim, California.

Dedicated to the development of internet commerce via the World Wide Web and the growth of the corporate intranet.

Hot Event, Cool Customers.

If you're a corporate decision maker, ICE is your best opportunity to find the productivity enhancing solutions you've been looking for.

Hundreds of leading hardware, software, and network services vendors will be at ICE to show you how to increase productivity and profitability via the latest internet technology.

A special 3-tier conference will provide a full range of hot topics that deal directly with the needs

of developers, IT managers, business managers and senior executives.

And you won't want to miss The Internet Open—an exciting new floor show that will get everyone fired up with the industry's largest-ever on-line demonstration of user applications for the World Wide Web.

If it's hot, it's here.

This is a must-attend show. So mark your calendar now for ICE. And this fall, get where it's hot! 



To register and pay on-line: visit our Web site at <http://www.idg.com/ice>.
Or call 1-800-867-4ICE (4423). Or fax 1-508-370-4323.

Internet Commerce Expo 111 Speer Street, PO Box 9107 Framingham, MA 01701





	CAPACITY	SUSTAINED TRANSFER RATE	HEAD LIFE	MTBF
MAMMOTH 8MM	40GB	6MB/sec	16,000 hrs	200,000 hrs
DLT 4000	40GB	3MB/sec	10,000 hrs	80,000 hrs

We're on the Web at <http://www.exabyte.com>. *21 Compressors in North America call us at 1-800-EXABYTE. In Europe call our office in The Netherlands at 01-26-2546000. Or in Asia, call our Singapore office at 65-27-19291.
©1996 Exabyte Corporation. Exabyte is a registered trademark of Exabyte Corporation. Exabyte Corporation, 1560 38th Street, Boulder, Colorado 80301 USA. Phone (303) 442-4233.

It's okay to take a flyer every once in a while. Makes life more interesting. But not with your tape backup technology. Data today is simply too critical, often irreplaceable.

Exabyte 8mm tape has long been the standard backup solution for mid-range UNIX/PC LAN environments. It's proven, trusted technology, with an installed base of more than one million drives and the endorsement of the world's leading computer manufacturers. And now Exabyte has moved the bar even higher. Our new generation of 8mm tape drives is faster and more reliable than any drive shipping today in the midrange market.

Named Mammoth, this new 8mm tape drive features 40 GB* of capacity, a blazing transfer rate of six megabytes per second* and an MTBF of 200,000 hours. Pretty heady numbers. And proof that Exabyte's 8mm technology is better than ever. Our products span a wide range, from the \$1,295-8700LT for smaller LANS, to our new generation of automated libraries. You'll also see Mammoth drives in products from leading OEMs.

So to all you adventurous types, sorry. Exabyte's new 8mm technology does push the limits of performance. But it's still the safest choice out there. For more on our 8mm tape products, or for a free Mammoth Facts Technical Paper, call 1-800-EXABYTE.

FORM FACTOR

5.25 standard half-high

5.25 non-standard full-high

EXABYTE 



DEAR LOUISE: My son-in-law is the kind of person who keeps dropping by without calling first. Then he won't leave. He's a nice guy—some kind of computer manager—but he won't stop blabbing. Night after night, it's "distributed environments" and "legacy systems" and "networked computing." He's obviously troubled and looking for answers, but I can't help. I'm in laundromats. How do I get my life back?

LOSING MY PATIENCE

DEAR LOSING: Be gentle, but be honest. Your son-in-law needs serious help. If you're not up to becoming an overnight expert in his field, try tacking a note to your door: "www.software.ibm.com/is/enterprise/." That's where he'll find instant access to all kinds of information about how other companies dealt with similar problems and found ways to run their businesses better. Or try earplugs.

DEAR LOUISE: I am a professional with years of experience. When I read to my arms, I am one.

for the
the must
The mo
phase,
improve



offer
it. The
your pa
make th



perfe
the fut
genera
favors
the op

Find out exactly how other corporations have successfully implemented enterprise-scale networked systems. Visit our Web site at www.software.ibm.com/is/enterprise/ or call us at 1 800 IBM-2468, ext. GA220, for an information pack. All questions answered.

Solutions for a small planet™

IBM

© 1999 IBM Corp. All rights reserved. The IBM logo is a registered trademark of International Business Machines Corporation. © 1999 IBM Corp. All rights reserved.



your own ship

By Robert L.
Schmidt

You may have dreamed of quitting corporate life and starting your own business. Meet three former IS professionals who have gone their own way and talk about their satisfactions — and challenges.

Stacy Yarnall
President and founder of IDTech, a startup in Dorchester, Mass., that goes online to develop systems that deliver business information to users.

Revenue/profits: Stacy also founded the business in May. Yarnall takes home half to two-thirds of what she earned at her last job. She hopes to match or exceed that within six months.

Lesson learned: Don't get so caught up in current assignments and paperwork that you don't scout for your next job.

Next Page

(www.computerworld.com)

Becoming an entrepreneur

RESOURCES

ONLINE

• **The Edward Lowe Foundation**
www.edlowe.org is web-organized resource for retail-business, business planning, federal and state organizations, trade associations, etc.)

• **U.S. Small Business Administration**
www.sbaonline.sba.gov

• **MIT Enterprise Forum**
web.mit.edu/entforum/www
Cambridge, Mass.
(617) 253-0015

• **The Entrepreneur's Corner Office**
catalog.com/corner (an Internet-based message board/chat group for entrepreneurs to post questions and seek advice)

• **Small Business Foundation of America: The Research Institute for Emerging Enterprises**
www.smba.org/BA/sbfs
722 12th St. NW,
Room 208,
Washington 20005,
(202) 628-8382

• **National Small Business Development Center**
www.smallbiz.sbnv.edu

• **Small Business Advancement Center**
www.sbaec.usa.edu

• **Cyberpreneur's Guide to the Internet**
msa.ngi.lib.umich.edu/chapters/cyberpreneur/cyber.html
(Created as part of a class taught at the School of Information and Library Studies at the University of Michigan, this site serves as a guide to Web pages, gateway sites, networks and newsgroups.)

• **Entrepreneur Resource Center**
www.20.mindlink.net/infocweb

• **On-line Small Business Workshop**
www.sba.gov/bc.ca/smallbiz/workshop

Steering

CONTINUED FROM PAGE 77

There's nowhere to run, nowhere to hide, and you're finally in charge.

That's what drove Hahnke to buy her 24-foot-long sleep two years ago while she was an assistant vice president at CS First Boston Corp., a global investment banking and securities firm in New York. It's also what drove her to jump the corporate ship and chart her own course by starting her own company.

Now, whether racing off the coast north of Boston or steering her business, Hahnke calls the shots.

Captaining her four-person crew is "the best management training one can have," she says. "Things get very tense: people make mistakes. There's time and performance pressure. You've got to keep everyone working and working at peak capacity. You can't walk away."

It sounds like trying to pay the mortgage while your biggest customer keeps forgetting to mail the check. But with a five-to-six-month financial cushion and a network of friends and co-workers to tap for job leads, Hahnke said she "felt personally ready to do it."

Running her own business has long been a dream for Hahnke. In the mid-1980s, as information systems director at a 46-person business finance firm, she saw the "holistic" view her peers took of loan applicants. "We had to do a credit evaluation, cash-flow analysis, accounting, balance statements, look at their sales and marketing efforts... I thought, 'Hey, this is a real challenge. You're really firing on all cylinders'" rather than

focusing on just IS.

During her eight years in financial services — most recently as director of fact financing at Fidelity Investment Co. in Boston — she came to see her prime skill as developing systems that deliver business information to users. She reasoned that if she could focus on that work as a consultant, she could fill a need in the market, build a business around that need and get more control over her life and work.

Hahnke's first big step on that road came last November when she joined Hurwitz Group, Inc., a consulting firm in Newton, Mass., as vice president and director of corporate services. Her role was to create consulting services aimed at IS managers. But within that role, she still "wasn't making the strategic business decisions, and that's what I wanted to try my hand at," she says.

That's why Hahnke took the plunge this spring, quickly learning just how

much administrative overhead a small business takes. Some of the tasks included setting up a business phone line to her house, figuring out which software to wear and meeting with her accountant. Despite the distractions, she says she can easily earn half her previous income to start and make it within six months.

Hahnke brings a healthy background in business, management and technology to her new role. But that background didn't come automatically. For example, for nine months, she spent 15 to 20 hours per week of her own time to get a securities broker's license and cultivated relationships with securities traders to learn the business through their eyes. She also cultivated mentors to help her learn management skills.

Any IS professional has multiple opportunities to pick up that training, Hahnke says. "But you have to strive to pick it up," she says, especially if you want to sail alone someday. ■



Through her years of working for someone else, Hahnke learned to make the big decisions. Now that she runs her own company, she relishes the challenge.

Eugene Bedell

Founder and CEO of Serf Technologies, Inc., an application development tool vendor in Cary, N.C.

Revenue: \$117 million; Profit: \$5.2 million (1995)

Lessons learned:

- It takes three times as long — and three times as much money — to develop software for the commercial market than for internal users.
- Don't rest on your laurels. Start changing your products and processes to meet the next challenge.

Bedell was born and raised to own a business.

He jokes that his entrepreneurial drive was "in the genes" — his parents Gene and Jean, who together owned a series of businesses that included auto dealerships, a manufacturer of fiberglass boats, a mortgage company and an accounting firm. Through it all, even when two businesses went out of existence at the same time, "there was always a supreme confidence that... they would start another one." They had no one to depend on except themselves, but they felt unbelievably secure," Bedell says.

So it's natural that Bedell's father couldn't understand why, after his son received his graduate degree, Bedell didn't find his own company instead of taking

a series of jobs. Bedell wound up carrying "in the multiple six figures" as a managing partner and chief information officer at CS First Boston, where part of his mission was to build enterprise-wide, distributed applications to help the firm adapt to rapid changes in the financial services market. The tools developed by Bedell's group to build those applications were so robust that other companies showed interest in buying them.

Managers at CS First Boston didn't want to get into the software business. So when they asked Bedell if he wanted to spin off the tools business in March 1990, "it was clear this was the right thing for me to do," he says.

Bedell wasn't your typical entrepreneur scratching out an existence in his

spare bedroom. He could afford an 80% pay cut and still invest \$100,000 in what is now Serf Technologies. It became profitable in 1991, went public in June 1995 and hit revenue and profit records in its first two quarters as a public company. But in the next six months, revenue fell 9%, compared with the same period a year earlier. And Serf lost \$10.4 million, compared with profits of \$1.5 million in the same period a year before.

At that time, Bedell said the downturn showed that Serf needed to speed up its efforts to broaden its product line beyond its initial high-end tool. Serf will try to address that with a series of product rollouts through the rest of this year. Serf also cut costs because of lower-than-expected sales by cutting 75 of its 675 jobs in the past three months, he says.

"The biggest mistake, and biggest challenge, has been... to get the company structured to move from \$120 million [in sales] to \$500 million," he says. "I don't think I made the changes that had to be made fast enough. Changes in product structure, changes in the distribution mechanisms, changes in partnership and even changes in management."

One factor that can slow a software company's response time is that it takes three times as long to develop software

that will be sold in the commercial market, compared with software that will be used only within a company. That's because users who buy software tolerate fewer bugs than users within the company who have no choice in its use, and the complexity of upgrades grows with the size of the installed base.

Bedell's years as a CEO helped him "understand how customers think," but they didn't give him other skills he needed as an entrepreneur. Those include the ability to sell, run a business and communicate with financial analysts.

Seer is changing. In April, it announced it was splitting the roles Bedell had held as president and CEO. Bedell is still CEO, but the company will give the president's title to a yet-to-be-named executive who will oversee operational issues, according to Bedell.



Gene Bedell has experienced trials and splits as CEO of Seer Technologies.

He says he doesn't expect his duties, which include product direction, decisions about distribution channels and partnerships with other companies, to

change. Living the example his parents set, Bedell insists he isn't discouraged by Seer's downturn and doesn't let it dominate his life. Although he "lives and breathes this company," Bedell says he limits his work week to between 50 and 60 hours so that he can spend time with his wife (who also works at Seer) and their two small children.

His annual income is "considerably less" than what he made at CS First Boston, but the move has been "very successful," taking into account the 38 to 4% of Seer stock he owns. But he still has one other tip for entrepreneurs: "Spend a lot less than you earn," so that you aren't stressed about your monthly cash flow. Bedell boasts he never buys a car unless he can afford to pay cash for it. "Of course now," he says chuckling, "I happen to own a Porsche." ■

Alex Bakman

President and founder of CleverSoft, Inc. in Scarborough, Maine, a vendor of tools to manage distributed applications, primarily Notes. The company was sold July 1 to Cande Corp. in Santa Monica, Calif., for an undisclosed sum.

Revenue/profits: Not disclosed, but Bakman says the firm has been profitable for the past six months, and sales have risen 35% per month for the past year.

Lessons learned:

- Marketing and sales are much more important to success than he thought — at least as technical skills.
- Be hard-nosed about what skills job candidates can bring to the job immediately.
- Everything takes longer than you expect. Focus.

Bakman knows artificial intelligence. He knows application management, distributed systems and Notes. What he didn't know when he started his own software company was "dog food."

Or to be more precise, he "didn't realize the degree to which [his firm] had to be a dog food business." That means Bakman had to produce products that the "dogs" wanted to eat or he was sunk.

"Technical proficiency in product development is a very small, minute component of building a successful company," says Bakman, who formed CleverSoft after he left Unum Corp., a life insurance company in nearby Portland, in August 1994. "Marketing and sales are just as important, if not more important," as the ability to juggle tools and focus on solving real customer problems.

For Bakman, that meant nailing his CleverWatch and CleverManage tools at administrators of Notes, a product whose complexities he came to know as a senior systems consultant at Unum. What helped keep him focused was the fact that he had only a six-month personal financial cushion, and he had to pay the two other former Unum developers on staff. His staff has grown to eight, but not without some turnover that taught him to take a closer look at applicants' skills.

After he sold CleverSoft, Bakman didn't suffer any postpartum depression. "This is a marriage of strengths," he says of combining CleverSoft's technology with Cande's deeper pockets and distribution channels. As Cande's vice president of solutions and research and development, Bakman says he'll be free to run "a business within a business" and keep CleverSoft focused on short development cycles and customer needs.

Before he joined Unum in 1991, Bakman worked in IBM's sales force, selling products and services to New York-based financial services firms. Before that, he worked in the computer giant's artificial intelligence laboratories. He says few of the skills he learned in large corporations have helped him in his new life, because while he worked for someone else, he mostly focused on technical issues.

"In the entrepreneurial world, you have to worry about everything from sales and marketing, finance, product development," he says.

One thing Bakman didn't have to worry about was building a customer base from scratch. Unum was happy to become his first customer because it was a cheaper and less risky way for the company to get the management tools it needed than to develop them in-house.

Having gotten to this point, does he feel like he's given away his child?

Absolutely not. "We're going to take this baby to its adolescence and into maturity," he boasts. "We're going for the long haul." ■

Schrier is a Computerworld senior editor, management.

RESOURCES

PUBLICATIONS

• **Business Strategies**
Newspaper
921 Pennix Street
Pittsford, N.Y. 14534
(716) 385-4800

• **The Entrepreneurial Edge**
921 Pennix Street
Pittsford, N.Y. 14534
(716) 385-4800
www.edgenline.com

• **Entrepreneur Magazine**
16 Pennix Ave.
Fairfield, N.J. 07004
(201) 808-1992

• **Idea Digest**
Idea Digest News
Magazine
Box 121.51, Nelson
Square 1220
808 Nelson St.
Vancouver, B.C.
Canada V6Z2H2
(604) 699-3936

SPECIALIZED ASSISTANCE, ETC.

• **American Women's Economic Development Corp.**
New York
(212) 682-9100

• **National Association of Women Business Owners**
Washington
(800) 55-WABO

• **Small Business Association**
Office of Women's Business Ownership
Washington
(202) 205-6673
www.sba.gov/womeninbusiness

• **Service Corps of Retired Executives**
Washington
(202) 205-7630

• **Minority Business Development Agency**
U.S. Department of Commerce
Washington
(202) 482-4847

— Compiled by research analyst Laura Hunt

WANT TO STRIKE OUT ON YOUR OWN? HERE ARE SOME POINTERS:

1. **Marketing and sales skills are as important as your technical skills.**
2. **Cash flow is important, especially if everything is coming out of your own pocket. Do you have a product or service someone will buy immediately?**
3. **Become a task juggler. Beyond the technical work, you'll be doing administrative, personnel, marketing and sales work.**
4. **Focus is crucial because there are only so many hours in the day, and everything will take longer than expected.**
5. **Expect to work longer hours and earn less, at least at first. Build a financial cushion beforehand, and keep it by living beneath your means.**

INTRODUCING THE FIRST HELP DESK WITH AUTOMATIC PROBLEM PREVENTION.

MORE THAN A REMEDY, IT'S THE CURE.

New Vycor Enterprise not only knows every caller, it knows how to keep them from calling.

Now there's a way to solve help desk problems faster and reduce your calls dramatically. Introducing Vycor Enterprise with network management integration and problem prevention.

Vycor Enterprise	Remedy
It stops	It stops
Power-Books	It stops
Yes	Yes
No	No
Yes	Yes
No	No
Yes	Yes
No	No

*As reported by former Remedy customers

Its unique problem prevention module lets you warn targeted users about network downtime, printer difficulties, software bugs and other problems before they are affected and call the help desk. You can also send out tips, new techniques and alternate

Vycor Enterprise is the first help desk solution that lets you manage, solve and even prevent problems across your entire enterprise.

It's unique problem

solutions. In each case, messages reach only those users who need to know. With Vycor Enterprise, users have fewer problems and you get fewer calls.

Network management integration puts you in control.

Vycor Enterprise integrates with McAfee's Saber LAN Workstation network management tools. So now you can get inventory and desktop configuration data for faster problem resolution—plus software distribution and configuration management for complete independence.

All of which lets you work more effectively and with less frustration. As reported by the Meta Group, "Combining these tools...can increase first line problem resolution significantly..."



And solving user problems is easier. Simply click on One Button Problem Resolution™ or use the key word search. Both use expertise-based reasoning to provide the probable solution in a matter of seconds.

Vycor Enterprise with management integration and problem prevention. It's the first complete help desk solution. Call today at 1-800-332-9966 to find out more.



McAfee

Network Security & Management

See Us At PC Expo, Booth #4862

WWW: <http://www.mcafee.com> Internet FTP: <ftp://mcafee.com> BBS: (408) 988-4004 America Online: MCAfee, Compuserve: GO MCAfee The Microsoft Network: MCAfee

Telephone (408) 768-2832 Fax (408) 710-9727 © McAfee Associates, Inc., 1996 All rights reserved. All brands and products are trademarks of their respective holders.

Special Advertising Supplement

July 22, 1996

AberdeenGroup

Universal Servers

RDBMS Technology for the Next Decade



A Computerworld Custom Publication

Introduction



Rebirth of the RDBMS

So elegant is the relational database management system (RDBMS) model that it has survived for 20 years, focusing on simple types of data: integers, scientific floating point, character strings, date/time and money.

However, the business world is not nearly as simplistic as it once was, and as a result, the RDBMS model has been pushed beyond its 20-year-old design capabilities. The need for data management solutions accessing complex data — in data warehouses, Web pages or competitive advantage applications — is exploding. And if RDBMSs have one drawback, it is that they do not handle highly complex information well.

Because of the RDBMS understands only simple types of data, it is under considerable technology pressure — from innumerable real-world applications that demand more information from the data.

A solution to the challenge facing RDBMSs — extensibility — is arriving in the form of the Universal

Server. The Universal Server will allow IS organizations to extend their current RDBMSs so that they can handle complex data types and work better with new technologies such as Intranets, relational-OLAP and the latest development toolsets — ensuring that enterprises can continue to leverage their existing investments in RDBMSs.

Universal Servers will allow IS organizations to extend their existing RDBMSs with complex data, functions and access techniques. And once ISVs create cross-industry and vertical-market-specific data extensions, IS will have more options for buying relatively inexpensive, reusable components instead of employing scarce database-programmer resources.

The Universal Server will be one of the most significant advances in RDBMS technology over the next decade. In this White Paper, Aberdeen Group looks at the short- and long-term benefits this technology holds, and will explain why it considers the Universal Server "the rebirth of the RDBMS."

This White Paper was written by Peter S. Kastner and Wayne T. Kernochan of Aberdeen Group Inc., a market research firm in Boston. Mr. Kastner — Group Vice President of Aberdeen, and general manager of its commercial systems practice — is a leading analyst of trends in databases, OLTP, decision support, client/server architectures, distributed commercial systems development and commercial benchmark auditing and analysis. He also conducts consulting studies in distributed systems planning, database management software and Internet/Intranet issues for both buyer and supplier organizations. Mr. Kernochan, as Vice President of Commercial Systems Research, implements Aberdeen's Buying Guides for distributed, open RDBMS and client/server application development environments, as well as consulting projects for Fortune 1000 clients and product vendors. He has 12 years of experience in DBMS, network operating systems, office automation, and E-mail for mainframe, midrange, Unix and PC LAN environments.

ILLUSTRATION BY LARRY GARDNER

All rights reserved by Computerworld Custom Publications, 500 Old Connecticut Path, Framingham, MA 01701

UNIVERSAL SERVERS

A Computerworld Custom Publication

White
paper

Universal Servers

RDBMS Technology for the Next Decade

The most serious challenge so far to the supremacy of RDBMSs in managing data is the increasing need of enterprises for complex and function-related data. An enterprise RDBMS hits the wall when all data must be expressed in RDBMS terms as simple data types.

Technology trends demand more complex data types, which RDBMSs support either with difficulty or not at all. Relational OLAP asks for large-scale multidimensional and time-series data. Internet and Intranet implementations demand text and graphic data types that RDBMSs have not fully integrated with their traditional numeric data. Object-oriented and client/server development toolsets fit best with data management systems when those systems provide high-level data types plus data "encapsulated" with the functions that operate on it.

In short, IS has pushed the RDBMS model beyond its 20-year-old design capabilities. Aberdeen Group believes the best way to extend installed RDBMSs is to add support for complex data types, creating a Universal Server — an RDBMS that allows users to access complex data types (including functions related to particular data types) and to

support open, extensible user-defined data types.

The key word in this definition is "open." For years, RDBMS vendors have offered proprietary add-ons which gave users incremental capabilities but did not let them extend the database to understand the data formats, functions or complex queries of their own industries . . . or even their own enterprises.

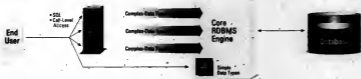
In contrast, the Universal Server architecture lets IS "have it your way." By promoting present and future "your way" extensibility, this architecture ensures a framework for customizing an RDBMS to its specific application mission, such as Internet OLTP.

Also, the Universal Server architecture does not require major rewrites or upgrades to current systems. Because IS simply adds new capabilities for complex data types to an existing RDBMS, the effect on a production system is minimal, and IS has full control over how much and how rapidly it takes advantage of the new functions. Figure 1 shows a typical Universal Server architecture.

What Universal Servers add

Universal Servers deliver the following seven new or upgraded capabilities to an enterprise RDBMS:

Universal Server Architecture



UNIVERSAL SERVERS

White
Paper

A Computerworld Custom Publication

1) *More support for complex data types*, via specific operations (e.g., search a video archive for a visual pattern) and storage of new types of data (e.g., multidimensional, text, multimedia or spatial). Many applications can benefit from having data in the right form for the application, as well as for the application user. For instance, a text-search capability applied to a comments field can extract repeated information that cannot be extracted by current RDBMS query capabilities.



With Universal Servers, enterprises can have their cake and eat it too — combine Web content that is rich in complex data types with highly scalable RDBMS technology.

2) *More support for complex operations on simple and complex data types*. Support for more complex functions is built into Universal Server extensions. For example, by including statistics and mathematics libraries in the core RDBMS, users of decision support systems will be able to perform complex data analysis without reinventing the wheel.

3) *More efficient high-level data access and computation*. Tuning the Universal Server's query optimizer for particular types of complex data can vastly improve querying speed on those data types. Likewise, complex computations such as pattern matching and economic-order-quantity functions scale better.

4) *Better fit with today's development tools, development processes and GUIs*. Even though development tools and processes operate at a high level on objects, components and templates (and layer higher level constructs on top of base components), most developers must still program RDBMS access at the simple-data level. Similarly, data-displaying GUIs based on object-oriented technology must link to crud-relational data items. Because Universal Server programming interfaces operate at the same high level as advanced development toolsets, programmer productivity on large-scale data-intensive applications can be vastly improved.

5) *Better fit with Internet/Intranet architectures*. Enterprises scaling their Internet and Intranet architectures and connecting them to back-end databases face difficulties merging text- and multimedia-heavy Web pages with simple-data RDBMSs. With Universal Servers, they can "have their cake and eat it too" — combine Web content that is rich in complex data types with highly scalable RDBMS technology.

6) *Effective ROLAP support*. As data miners drive deeper into ever-larger data types translate into a need for more complex queries. The bit-mapped indexing, star schemas and aggregation support of today's Relational OnLine Analytic Processing (ROLAP) and RDBMS suppliers can deliver order-of-magnitude improvements in the speed of complex queries, but further improvements require that multidimensionality, aggregation and time-series support be driven farther into the RDBMS core — particularly into the query optimizer.

Thus, Universal Server support for multidimensional and time-series complex data types allows designers of data warehouses and developers of querying applications to take advantage of new complex-query speed-ups. Moreover, it incorporates multidimensionality in the core RDBMS, with significant performance advantages over approaches using separate OLAP engines.

7) *Most important, the Universal Server adds extensibility to an RDBMS*. The Universal Server's open support for user-defined data types gives IS far more flexibility to adapt to changing user demands and to technologies requiring new data types. Moreover, RDBMS makers and VARs now have the opportunity to deliver customized and vertical-industry-specific modules supporting complex data types.

Business benefits of a Universal Server

"What are the 13-week average sales for our top five profitable products?" Business-managers asking this simple question do not know that to implement it, an RDBMS programmer must churn out and test several pages of SQL code to first calculate the profitability of products, then rank them by profitability, and then calculate the 13-week average sales. Nor do they realize that the query must be reworked the

UNIVERSAL SERVERS

following week. The 13-week average changes every week, but because the RDBMS does not understand time series, moving averages or ranking, the programmer must force-feed it with a program embodying these "complex data types."

Universal Server ROLAP extensions that define functions for ranking, profitability and time series will make the programmer's job simpler and will result in much smaller programs that are more likely to be error-free. They will also make it easier for users with desktop query tools to express their data needs in terms much closer to business reality, fostering faster "data knowledge" activities by users.

However, the long-term benefits of Universal Servers will be even more significant, since they will apply to commercial applications in nearly all industries. For example, exploding bill-of-materials and calculating economic order quantities are difficult tasks with today's RDBMSs. But with Universal Servers, they will be relatively straightforward, allowing more effective just-in-time resource planning.

Enterprises will also be able to query their videotape records and on-site-camera video feeds for particular patterns. For example, video cameras monitoring an assembly line can feed video data into a Universal Server database that can detect anomalies such as defects and trigger corrective action, thus improving product quality at lower cost.

Figure 2 lists other opportunities for companies implementing Universal Servers.

Informix's role

With its acquisition of Illustra, Informix has become the leader in Universal Server technology. It can now combine its scalable Informix-OnLine architecture with Illustra's DataBlade modules (add-ons that support complex data types). Full integration between the two is scheduled for year-end.

Informix plans on releasing 25 DataBlade modules by year-end, covering data types such as text, video, ROLAP and spatial, as well as specific functions such as banking.

The currently available INFORMIX-Universal Server development toolkit provides a debugger and a class library for data access tools, and support for C-language functions. In the future, users will be able to take advantage of Informix's NewEra development toolset, but today they can already partition DataBlade components between client and server. VARs and power users can develop their own DataBlade modules, ensuring that IS can exploit industry- and application-specific database extensions.

Informix is also adapting key features of its core architecture. For instance, extending its query optimizer to handle complex queries and complex data types at a higher level should add complex-data-type performance scalability to an Informix-OnLine architecture already regarded as a leader in parallel scalability. Also, supporting complex data types across the Informix architecture should lead to exceptional support in its administrative toolsets.

Examples of Opportunities for Universal Servers

Area	Opportunity
Financial/Insurance	Derivative calculation, quantitative-model scaling, actuarial tables, currency conversion
Manufacturing	Bill-of-materials explosion, economic order quantity computation
Healthcare	Treatment coding hierarchies, image and document management
Data Warehouses	Aggregates, time series, business model-based data mining
Sales and Marketing	Geographical, spatial, and demographic (e.g., sales by area) data, customized multimedia demos
Security	Monitoring video cameras for changing patterns
Entertainment Industry	Querying videotape archives, retrieving live-broadcast material for immediate playback, supporting pay-per-view
Pharmaceutical	Molecular modeling and computational chemistry
Communications	Parsing telephone numbers, decoding IP addresses (e.g., for the Internet)

Source: Aberdeen Group, 1996

UNIVERSAL SERVERS

White
paper

A Computerworld Custom Publication

Picking the right Universal Server

Aberdeen Group recommends two yardsticks for determining how well RDBMS suppliers have implemented Universal Server technology.

1) Degree of extensibility/flexibility. A Universal Server should provide an architecture for extensions that handles a range of common or important data types. It should also allow IS to define custom data-type extensions ("user-defined data types") for particular industry or an-

turn will coordinate the many extensions and permutations needed to meet real-world application requirements.

2) Integration of Universal Server technology with the main components of the core RDBMS engine. Applying the scalability, support of distributed databases, and open flexibility of today's high-end RDBMSs to complex data types requires that each core-engine element support

traction and transparency.

How much does the high-level "vanilla" with which a Universal Server surrounds a complex data type slow performance? How well do RDBMS scalability techniques such as cost-based optimizers and parallel-execution technology translate to new data types? No RDBMS benchmark can yet measure Universal Server performance in real-world customer situations. For now, enterprises should create their own benchmarks based on their own complex data types.

A Universal Server administration tool should extend today's RDBMS and systems management tools to provide a view of, and allow operations on, the overall complex data type and its simple-data-type components, as well as the relationships between components and the functions associated with the data type. For complex data types (some of whose components are in different databases within a distributed database), an administration toolset should provide both a global view and a single-database view.

The Universal Server should provide either the same or similar operations on complex data types as on today's simple data types (e.g., insert, delete, join); a similar look-and-feel for data display; and APIs or class libraries that do not require a migration effort for existing RDBMS-based applications. This "overloading" will allow enterprises to reuse code for new data types without major rewrites.

The IS Buyer's Universal Server Checklist

- Does it support the major complex data types (e.g., text, video, audio, image, and spatial)? In particular, can it accept new indexing methods for new data domains?
- Is it extensible, e.g., via user-defined data types and open APIs?
- Is it integrated with a distributed, open, scalable RDBMS (e.g., does it offer parallel scalability and replication technology for distributed-database support)?
- Is it architected to be highly extensible and flexible, via a wide range of complex data types supported, with powerful development tools to create further extensions and with broad third-party and VAA support?
- Is the technology driven deep into the architecture — for instance, does the query optimizer understand specific complex data types and what to do with them?
- Does it deliver high performance and scalability for the complex data types that the enterprise needs?
- Do development and administrative tools support complex data types?
- Can RDBMS data-access operations (e.g., join) be applied across data types?

Source: Aberdeen Group, 1998

Is it a Universal Server?

How Effective a Universal Server is it?

enterprise needs, e.g., a data type related to a business process. It should also supply flexible development tools and APIs or class libraries that support high-level data access and integrate well with an enterprise's other server-side development tools. Ideally, the architec-

ture new data. For instance, a query optimizer should handle particular complex data types as well as a generic BLOB (binary large object) data type.

When it comes to assessing a Universal Server, there are three other factors: performance, adminis-

UNIVERSAL SERVERS

and "overloading" across DataBlade modules. Finally, these architectural changes will allow SAP, PeopleSoft, Baan and other vendors to migrate their client/server applications to Informix's Universal Server without application code changes.

Universal Server competitors

Oracle has folded its Video Server, ConText and Spatial Data options into Oracle7.3. The Video Server database is separate; the ConText text database (an extension to 7.3), merged with Oracle7's simple data, is slated to ship soon. Oracle's Developer/2000 toolset provides a server-side toolkit for multimedia data types, but these complex data type extensions are still distinct database servers, neither fully integrated with Oracle7 nor highly extensible. For more extensive integration and user-driven extensibility, customers will have to wait for the company's "object" release, Oracle 8.0, in 1997.

IBM's DB2 Common Server (for OS/2 and Unix

platforms) offers functions to access parts of a data type, as well as the ability to insert a data type too large for main memory into the database. DB2 also includes bundles of triggers, user-defined data types and user-defined functions for particular data types called Relational Database Extenders (e.g., a text, imaging, audio or video server). These Extenders will support fingerprint analysis and querying by SQL of image content (color, shape or pattern).

In the long term, the text Extender may prove particularly valuable, because it includes information retrieval technology. However, IBM has not yet driven this support for complex data types deep into the DB2 architecture. Nor are Extenders yet included in DB2 Parallel Edition or DB2/MVS.

Computer Associates' dual-database strategy includes CA-Ingres and Jasmine, an OODBMS with a multimedia- and Internet-enabled toolset. CA has no plans to combine the two or to otherwise offer Universal Server functionality. Nor has CA fully integrated extensibility of complex data types into CA-Ingres or driven it into the architecture.

Neither Sybase nor Microsoft yet offer support for complex data types comparable to Informix, although Sybase has announced that, to allow ISVs to link snap-in complex data types with SQL Server System 11, it will provide an Adaptive Server combined with its ObjectConnect middleware.

Conclusion

Universal Servers will be the next big RDBMS technology wave. Enterprises can gain strategic advantage today by using Universal Servers for deeper data mining, multimedia Intranet and Internet architectures, developing large-scale applications, and adding complex-mathematics and data manipulation features to current customer-interface and back-office systems.

Long-term benefits, however, are likely to come from innovative functional or vertical-industry applications. To succeed in these, users should start learning the ropes in such areas as design, administration and scaling performance. As for IS, it needs to choose a Universal Server wisely, target strategic opportunities proactively, and begin planning and prototyping implementations immediately. ■

Not enough OOmph

In the early 1990s, it seemed like object-oriented DBMSs might be the IS choice for accessing complex data. OODBMSs allow developers to handle high-level and complex data types, especially CAD/CAM graphics and text databases. But because they were created from the ground up, they lacked the advantages of RDBMSs that IS had come to expect: superb query capabilities with SQL; excellent OLTP performance; and an ISV industry providing complementary utilities and application solutions.

To match the scalability, flexibility and robustness of their relational counterparts, it was necessary for OODBMSs to implement multithreading and SMP support, distributed database features and open gateways from scratch. Unfortunately, they were, in effect, chasing a moving target from far in the rear. As a result, the market so far has decreed that OODBMSs are niche players, not yet appropriate for large-scale or mission-critical applications.

From now on, if you can
imagine it,
you can
manage it.



**Informix Introduces
The First Truly
Universal Server.**

Imagine this.

An infinitely scalable, multi-function relational database, that can be further enhanced by anyone, to do anything, with any kind of information. In other words, the INFORMIX-Universal Server.

Informix's unique DataBlade™ technology gives you the ability to manage any type of data, from text and numbers to sound, video, web pages — even time-series and geo-spatial data. And whatever else you need to unleash the power of business innovation.

Call 1-800-688-IFMX, ext. 51, to get a copy of the Aberdeen Group's white paper. Or visit us on the web at www.informix.com, for examples of DataBlade technology in action.

Once you've seen Informix's Universal Server, it'll be hard to imagine managing without it.

 **INFORMIX®**

© 1996 Informix Software, Inc. The Informix and DataBlade trademarks of Informix Software, Inc. are used herein under license. All other trademarks are the property of their respective owners. Informix, the Informix logo, and DataBlade are trademarks of Informix Software, Inc. All other trademarks are the property of their respective owners.



Hype headaches

*IS execs feel pressure
to rush 'net projects*

BY JOSEPH MAGLITTA

CONTINUED FROM PAGE 1

"Everybody is an instant Internet expert," says Mary Jo Orzech, director of academic computing services at the State University of New York in Brockport. "It's driving me crazy."

Many of her colleagues agree. A new

Computerworld survey of 100 high-level information systems managers found that the barrage of Internet coverage in the mainstream media during the past 18 months has caused new pressures and more work for technology groups. The

Hype headaches, page 85

ATM



*Digital switches are
equally at home in
stand-alone, rack-
mount or chassis
configurations.
So your network
can grow, without
leaving your
switches behind.*

*Enterprise Virtual Intelligent
Switched Networks: Digital's
comprehensive road map from
wherever you are now to the
virtual networking of the future.*

en **VISION™**

WE ONLY BUILD SWITCHES FOR THE REALLY IMPORTANT NETWORK TECHNOLOGIES:

NAMELY, ALL OF THEM.

In devising a network strategy, Digital believes "and" is a vastly more powerful notion than "or." Which is why Digital offers switching solutions for Ethernet and FDDI, ATM and IP. A comprehensive family of price/performance leading switches, including the world's fastest FDDI and IP Switches—for secure, high-speed network or Internet access. Like all Digital network solutions, Digital switches are flexible, modular and scalable from desktop to enterprise. And backed by an unmatched worldwide service and support system.

For more details,



see your Digital

Business Partner, call 1-800-457-8211 or visit

digital™

WHATEVER IT TAKES™

www.networks.digital.com. And ask

about the network switches designed

around the most powerful technology of all: the power of choice.

©1996 Digital Equipment Corporation. Digital, the DIGITAL logo and the PERFORM logo are trademarks and Whatever It Takes is a service mark of Digital Equipment Corp. All other products are trademarks or registered trademarks of their respective companies.

BRAKE FOR
FAST ETHERNET

YOU CAN SPOT A SERIOUS NETWORKING PRO A MILE AWAY.

I'd rather be driving
my switch.

When serious networking pros want to get up to speed on everything from LANs to global enterprise networks to the Internet, they floor it straight for one place: NetWorld+Interop in Atlanta. NetWorld+Interop brings together more than 500 of the world's top vendors and thousands of the latest products. All connected via our 6000 node, multivendor, multiprotocol network proving ground—the InteropNet*. So you can see 100 Mb/s Ethernet technologies. Switching and routing. Internet and

intranet. Plus wireless, ATM, LAN emulation, Fibre Channel, frame relay transports, and hundreds more. Pure and simple, NetWorld+Interop is about interoperability. Whether you're integrating classical networks with cutting-edge technologies, or starting from scratch. And with 50,000 colleagues and experts on-site, you'll get even your toughest questions answered. So if you're serious about networking, save \$50 by registering free today at www.interop.com. You'll be speeding along in no time.

NETWORLD+INTEROP

CONFERENCE: SEPT. 16-20 • EXHIBITION: SEPT. 18-20 • GEORGIA WORLD CONGRESS CENTER • ATLANTA, GEORGIA

Save \$50 and register FREE at <http://www.interop.com> • Or call 800-488-2883

10

COMPUTERWORLD

Professional Courtesy Voucher

☐ Yes, I want to receive my own copy of **COMPUTERWORLD** each week. I accept your offer of \$39.95* per year - a savings of \$8.05 off the basic subscription price.

First Name MI Last Name

Title 2

Company

Address

City State Zip

Address shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year

*U.S. Only Canada \$50 Mexico Central/South America \$150 Europe \$206, all other countries \$250

Foreign orders must be prepaid in U.S. dollars. For faster service, fax your order to (505) 628-5705.

Please complete the questions below to qualify for this special rate.

- 1. BUSINESS/INDUSTRY** (Circle one)
 - 10 Manufacturer (other than computer)
 - 20 Financial/Insurance/Real Estate
 - 30 Healthcare/Healthcare
 - 40 Wholesale/Retail Trade
 - 50 Business Services (except CP)
 - 60 Government/State/Federal/Local
 - 70 Communications Systems/Public Utilities/Transportation
 - 80 Information/Consulting/Professional Services/Other
 - 90 Manufacturer of Computers, Computer-Related Systems or Peripherals
 - 95 Systems Integrators, Vendors, Computer Service Providers, Software Planning & Consulting Services
 - 99 Computer/Peripheral Dealer/Consultant/Reseller
 - 00 Other _____ (Please specify)

- 2. TELEFUNCTION** (Circle one)
 - 10 BASIC/COMP MANAGEMENT
 - 20 Data Information/Database/Processing/Management/VP/EXECUTIVE Mgmt.
 - 30 Development/MSB Services, Info. Center
 - 40 On-Site Support/Rep. Desk/Help Center, User Mgt./PC Mgt. Tech. Planning/Administrative Services
 - 50 On-Site Support/Development, Systems Architecture
 - 60 Programming/Mgmt., Software Development
 - 70 Engineering, Scientific, R&D Tech. Mgmt.
 - 80 Sys. Integrators/Vendors/Consulting Mgmt.
 - 90 Other _____ (Please specify)

- 3. DEPARTMENTAL MANAGEMENT**
 - 31 Sales & Marketing Mgmt.
 - 32 Marketing, Legal, Accounting Mgmt.
 - 33 OTHER PROFESSIONAL MANAGEMENT
 - 34 Information/Consulting/Services, Education, Journalism, Students
 - 35 Other Time Personnel

Do you use... evaluate, specify, recommend, purchase (Circle all that apply)

Computing Systems

 - 40 Systems (a) Yes (b) No
 - 41 Hardware (a) Yes (b) No
 - 42 Software (a) Yes (b) No
 - 43 Other (a) Yes (b) No
 - 44 Other (a) Yes (b) No
 - 45 Other (a) Yes (b) No
 - 46 Other (a) Yes (b) No
 - 47 Other (a) Yes (b) No
 - 48 Other (a) Yes (b) No
 - 49 Other (a) Yes (b) No
 - 50 Other (a) Yes (b) No
 - 51 Other (a) Yes (b) No
 - 52 Other (a) Yes (b) No
 - 53 Other (a) Yes (b) No
 - 54 Other (a) Yes (b) No
 - 55 Other (a) Yes (b) No
 - 56 Other (a) Yes (b) No
 - 57 Other (a) Yes (b) No
 - 58 Other (a) Yes (b) No
 - 59 Other (a) Yes (b) No
 - 60 Other (a) Yes (b) No
 - 61 Other (a) Yes (b) No
 - 62 Other (a) Yes (b) No
 - 63 Other (a) Yes (b) No
 - 64 Other (a) Yes (b) No
 - 65 Other (a) Yes (b) No
 - 66 Other (a) Yes (b) No
 - 67 Other (a) Yes (b) No
 - 68 Other (a) Yes (b) No
 - 69 Other (a) Yes (b) No
 - 70 Other (a) Yes (b) No
 - 71 Other (a) Yes (b) No
 - 72 Other (a) Yes (b) No
 - 73 Other (a) Yes (b) No
 - 74 Other (a) Yes (b) No
 - 75 Other (a) Yes (b) No
 - 76 Other (a) Yes (b) No
 - 77 Other (a) Yes (b) No
 - 78 Other (a) Yes (b) No
 - 79 Other (a) Yes (b) No
 - 80 Other (a) Yes (b) No
 - 81 Other (a) Yes (b) No
 - 82 Other (a) Yes (b) No
 - 83 Other (a) Yes (b) No
 - 84 Other (a) Yes (b) No
 - 85 Other (a) Yes (b) No
 - 86 Other (a) Yes (b) No
 - 87 Other (a) Yes (b) No
 - 88 Other (a) Yes (b) No
 - 89 Other (a) Yes (b) No
 - 90 Other (a) Yes (b) No
 - 91 Other (a) Yes (b) No
 - 92 Other (a) Yes (b) No
 - 93 Other (a) Yes (b) No
 - 94 Other (a) Yes (b) No
 - 95 Other (a) Yes (b) No
 - 96 Other (a) Yes (b) No
 - 97 Other (a) Yes (b) No
 - 98 Other (a) Yes (b) No
 - 99 Other (a) Yes (b) No
 - 00 Other (a) Yes (b) No

SAVINGS STATEMENT

Regular Subscription Price

~~\$48.00~~

Your Special Price

\$39.95

Your Savings

\$8.05

- 4. How many people are employed at this location and in your entire organization, including all of its branches, divisions and subsidiaries?** (Select only one per column)

	1 to 50	51 to 100	101 to 250	251 to 500	501 to 1,000	1,001 to 2,500	2,501 to 5,000	5,001 to 10,000	10,001 to 25,000	25,001 to 50,000	50,001 to 100,000	100,001 to 250,000	250,001 to 500,000	500,001 to 1,000,000	1,000,001 to 2,500,000	2,500,001 to 5,000,000	5,000,001 to 10,000,000	10,000,001 to 25,000,000	25,000,001 to 50,000,000	50,000,001 to 100,000,000	100,000,001 to 250,000,000	250,000,001 to 500,000,000	500,000,001 to 1,000,000,000	1,000,000,001 to 2,500,000,000	2,500,000,001 to 5,000,000,000	5,000,000,001 to 10,000,000,000	10,000,000,001 to 25,000,000,000	25,000,000,001 to 50,000,000,000	50,000,000,001 to 100,000,000,000	100,000,000,001 to 250,000,000,000	250,000,000,001 to 500,000,000,000	500,000,000,001 to 1,000,000,000,000	1,000,000,000,001 to 2,500,000,000,000	2,500,000,000,001 to 5,000,000,000,000	5,000,000,000,001 to 10,000,000,000,000	10,000,000,000,001 to 25,000,000,000,000	25,000,000,000,001 to 50,000,000,000,000	50,000,000,000,001 to 100,000,000,000,000	100,000,000,000,001 to 250,000,000,000,000	250,000,000,000,001 to 500,000,000,000,000	500,000,000,000,001 to 1,000,000,000,000,000	1,000,000,000,000,001 to 2,500,000,000,000,000	2,500,000,000,000,001 to 5,000,000,000,000,000	5,000,000,000,000,001 to 10,000,000,000,000,000	10,000,000,000,000,001 to 25,000,000,000,000,000	25,000,000,000,000,001 to 50,000,000,000,000,000	50,000,000,000,000,001 to 100,000,000,000,000,000	100,000,000,000,000,001 to 250,000,000,000,000,000	250,000,000,000,000,001 to 500,000,000,000,000,000	500,000,000,000,000,001 to 1,000,000,000,000,000,000	1,000,000,000,000,000,001 to 2,500,000,000,000,000,000	2,500,000,000,000,000,001 to 5,000,000,000,000,000,000	5,000,000,000,000,000,001 to 10,000,000,000,000,000,000	10,000,000,000,000,000,001 to 25,000,000,000,000,000,000	25,000,000,000,000,000,001 to 50,000,000,000,000,000,000	50,000,000,000,000,000,001 to 100,000,000,000,000,000,000	100,000,000,000,000,000,001 to 250,000,000,000,000,000,000	250,000,000,000,000,000,001 to 500,000,000,000,000,000,000	500,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000	1,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000	2,500,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000	5,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000	10,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000	25,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000	50,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000	100,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000	250,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000	500,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000	50,000,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000,000	100,000,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000,000	250,000,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000,000	500,000,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000,000	50,000,000,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000,000,000	100,000,000,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000,000,000	250,000,000,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000,000,000	500,000,000,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000,000,000	50,000,000,000,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000,000,000,000	100,000,000,000,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000,000,000,000	250,000,000,000,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000,000,000,000	500,000,000,000,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000,000,000,000	50,000,000,000,000,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000,000,000,000,000	100,000,000,000,000,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000,000,000,000,000	250,000,000,000,000,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000,000,000,000,000	500,000,000,000,000,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000,000,000,000,000	50,000,000,000,000,000,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000,000,000,000,000,000	100,000,000,000,000,000,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000,000,000,000,000,000	250,000,000,000,000,000,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000,000,000,000,000,000	500,000,000,000,000,000,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000,000,000,000,000,000	50,000,000,000,000,000,000,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000,000,000,000,000,000,000	100,000,000,000,000,000,000,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000,000,000,000,000,000,000	250,000,000,000,000,000,000,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000,000,000,000,000,000,000	500,000,000,000,000,000,000,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000,000,000,000,000,000,000	50,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 100,000,000,000,000,000,000,000,000,000,000,000,000,000,000	100,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 250,000,000,000,000,000,000,000,000,000,000,000,000,000,000	250,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 500,000,000,000,000,000,000,000,000,000,000,000,000,000,000	500,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	1,000,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 2,500,000,000,000,000,000,000,000,000,000,000,000,000,000,000	2,500,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 5,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	5,000,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 10,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	10,000,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 25,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	25,000,000,000,000,000,000,000,000,000,000,000,000,000,000,001 to 50,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000	5
--	---------	-----------	------------	------------	--------------	----------------	----------------	-----------------	------------------	------------------	-------------------	--------------------	--------------------	----------------------	------------------------	------------------------	-------------------------	--------------------------	--------------------------	---------------------------	----------------------------	----------------------------	------------------------------	--------------------------------	--------------------------------	---------------------------------	----------------------------------	----------------------------------	-----------------------------------	------------------------------------	------------------------------------	--------------------------------------	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---	--	--	--	--	--	---	--	--	---



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



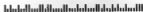
BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 558 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



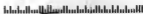
BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 558 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P O BOX 2044
MARION OHIO 43306-4144





Hype headaches

CONTINUED FROM PAGE 81

biggest complaint: unrealistically high user expectations.

"There's a heightened anticipation from all the hype," says Ron Shepp director of technical services at SeaLand Corp. in Miami. "I'm not sure we're able to meet it."

Overall, IS managers say sharing the spotlight with a media darling has brought more clamor than glimmer.

Among the survey findings are the following:

- 36% of IS managers polled have diverted precious resources to Internet projects as a direct result of top management reading press reports about the technology

- 28% report spending "more time than I should" responding to business unit or functional managers' inquiries about the Internet prompted by media coverage.

- 16% say "overinflated expectations about the Internet have caused us to waste money."

And if savvy-eyed users don't kill you, the sheer crush of materials might. In one week in early July, a search turned up no fewer than 7,325 references to "Internet," "Intranet" and "World Wide Web" in newspapers and magazines. That doesn't include thousands more references in research reports, vendor materials or anything published electronically.

"I spend literally half my time reading," says Matthew Kristin, workflow solutions manager at Concert Management Services, Inc. in Reston, Va. He heads intranet projects at the company. Other IS executives confess in private that they've stopped trying to keep up with Internet and intranet news. Says one: "There's no way I have to rely on my senior technical people."

Squeezed play

Of course, not all senior executives swoon over the Internet. Many have been burned before by flash-in-the-pan technologies.

Moreover, stories about computer hackers and viruses have heightened anxiety for many top executives, which can make it difficult to continue or even start important projects.

Thus, many IS managers find themselves squeezed between Web-crazy users and cautious but chary CEOs.

Publicity about the Internet seems to have fueled the revolt of end users bent on buying and maintaining their own systems.

That revolt began when PCs hit offices in the early 1980s. "You're starting to see more competition from other nontechnical executives trying to run some of these technologies," says George Brenner, vice president and chief information officer at MCA/Universal in Universal City, Calif.

Unfortunately, Brenner says, booming interest in Internet technology can create situations in which a little knowledge is dangerous to users and the corporation. "When people start doing their own things, costs are going to go sky-high."

He tells of one executive several years ago who ran an expensive T1 line into a conference room when IS was working on the same thing. "That gal is no longer with the company," he says.

Collette Coad, who heads Internet and intranet implementation at Ernst & Young, agrees that Internet publicity has created new dissatisfaction. "We hear rumbling about IS not being proactive enough, or not providing Internet access, or people not being able to find what they want or the high cost," she says.

Coad says the rush to build home pages, often without adequate skills, can be "a distraction from other major projects."

At SUNY Brockport, for example, Oranck says faculty members were eager to create departmental home pages. So they diverted a five-person group from work on key student accounting and management systems. "We did that for a brief amount of time before saying, 'We'll train you and give you tools to do it.' But everything else fell behind after they had made it Priority One."

Silver linings

Of course, Internet mania hasn't been all bad. Jim Sutter, vice president and general manager of IS at Rockwell International Corp., says the widespread publicity "has been a blessing" for the Seal Beach, Calif., firm. "There's a certain skepticism."

"But it's helped build Internet and intranets into

the mind-set. It reinforces everything we are trying to do," he says. Sutter says that unlike client/server a few years ago, the Internet stands a good chance of living up to the hype, thanks to more mature products and tools that sometimes deliver dramatic results.

"Senior people ... get excited when they see something delivered in a short time—a couple of days or weeks," he says. "It's been that phenomenon that's rapidly spurred interest."

Many CEOs are interested, agrees Charles Lucier, senior vice president and chief knowledge officer at Booz Allen & Hamilton, Inc., a consulting firm in McLean, Va. "They suspect the Internet might be useful to address the important issues on their agenda: Stimulate global growth, manage customers and suppliers, and move beyond business process engineering," he says.

Media coverage has sparked that interest, Lucier says. "We didn't get a lot of questions about client/server tools and [computer-aided software engineering] from CEOs in the past. This is different."

In some cases, widespread publicity has helped redirect IS efforts, especially in development, toward the Internet and intranets. But even that has produced new pressures.

"We have decided to make a major shift toward the Internet and intranets—whether or realistic or not—probably won't. Nor will workloads. 'CEOs may forget specific technologies,' Lucier says, "but they don't forget unrealistic promises."

Even if the media's flicker spotlight fades, expectations about the Internet and intranets—whether realistic or not—probably won't. Nor will workloads. "CEOs may forget specific technologies," Lucier says, "but they don't forget unrealistic promises."

Oranck predicts, "Our 15 minutes of fame will be followed by three years of darkness."

Maguire is Computerworld's senior editor, corporate strategies.

Reading more, believing less

When it comes to media coverage of technology, more definitely isn't better. Many IS managers say they are reading more about the Internet but believing less of what they read.

40% agreed that "the news media's coverage of the Internet has reduced my confidence in the media's ability to accurately report new technologies."

73% agreed that "the news media often hype technologies beyond their potential benefit."

39% say they have reduced reliance on information from the news media in making decisions because of "hot hype." In interviews, some IS managers say they use a wider mix of peers, consultants and online sources to get technology information.

55% agreed that "the media and investment community hype about the Internet is out of proportion to today's actual usage by business." Skepticism was strongest in companies with less than \$100 million and more than \$1 billion in annual sales.

Overall, technologists say they filter information to get a realistic picture. But many say they believe business leaders and business units have technical understanding are less able to do so. Despite what they see on hype, many's delayed decision in implementing Internet plans.

66%

Source: Representative sample of 285 senior IS managers

Computer Careers

Master of your destiny

Experts agree that an advanced college degree can be the key to taking an IS career further, faster.

by Leslie Goff



You're certified in a couple of different tools. You go to training seminars and workshops. You keep up with developments well enough. Yet you aren't moving up the information systems ladder as quickly as you'd like. It may be time to consider going back to school.

Traditional drill-and-practice skills training remains an important part of maintaining competencies. But a master's degree that complements your undergraduate degree and professional experience can sweeten your chances for a more fruitful IS career, according to IS managers, trainers and recruiters.

"If your intent in furthering your education is to gain new opportunities in new companies, an MBA can be a tiebreaker," says Norm Lord, a manager at Liberty Mutual Insurance Co.'s Performance Support group, the insurer's training division in Portsmouth, N.H.

The motivation or time to commit to a degree program can elude many IS professionals. But continuing education classes tend to go deeper into a technology's roots and focus more on conceptual issues than training seminars. They can supply a mental and professional edge.

"When you see a university course on someone's resume,

you know there's been time for the information to really sink in," says Jim Tomynko, associate director of the Masters of Software Engineering Program at the School of Computer Science at Carnegie Mellon University in Pittsburgh. "With a training class, you lose 50% of the information the first day after the course, and overall, you do well to hang on to 20% of it."

The potential benefits of a better-educated IS staff are recognized by more corporations and universities alike. The result is a plethora of educational opportunities for IS professionals, such as the following:

- Many companies are bringing the classroom to the employee. Formal partnerships with nearby universities allow companies to offer on-site master's degree programs to their employees, such as the Master's in Computer Science offered by Boston University at Liberty Mutual in Portsmouth (see sidebar). Other companies use ad hoc arrangements.

- Tuition reimbursement programs are a staple benefit at most large companies.

- Topflight computer science schools, such as Carnegie Mellon (www.cs.cmu.edu) and MIT (The Global Network Academy, www.gna.mit.edu/), offer online courses and degrees aimed at busy professionals who don't have the time or the means to attend the schools.

"Force yourself to get some extra education," says Phil Kaufman, assistant vice president of professional development in the IS training group at Chubb & Son, Inc. in Warren, N.J. "In the IS profession, if you haven't learned anything new in a while, you're at risk. Unless you're changing careers, force yourself to expand your horizons." ■

Goff is a freelance writer in New York.

On the inside track

STEVE ABBOTT

Director of administration
Revenue management department, Alamo
Rent-A-Car, Inc., Fort Lauderdale, Fla.
MBA, accounting
Florida International University
August 1994
Bachelor of science, computer science
University of Florida, May 1992

At 26, Abbott is the youngest director at Alamo, a status he attributes to getting his master's degree. "It's allowed me to achieve levels that others achieve at a much longer period of time," he says. While in Alamo's IS group, Abbott became a senior programmer in less than two years while working on his degree. He oversees the design of a fleet-planning system that will be in a new revenue management system.

"My technical skills provided me the opportunity to fit in to this key role," Abbott says. But it was the MBA that clinched the deal: "I thought the combination of accounting and computer science would give me a good value package, and that had a lot more to be said." Taking advantage of Alamo's tuition reimbursement program, Abbott took two courses each semester. He worked at Alamo 65 to 70 hours per week and was in class five nights per week.

"I don't think I would've learned so much at times," Abbott says. "But I just kept thinking about the benefits. My goal was set, and I knew what I wanted."

Lessons to live by

STEPHEN BOAD

Senior technical instructor
Performance support group, Liberty
Mutual Insurance Co., Portsmouth, N.H.
Master of science, computer science
Boston University, May 1996
Bachelor of science,
business administration
University of New Hampshire,
December 1989

Broad, who teaches C and C++ programming, had two reasons to pursue a master's degree. Since he was in a highly technical environment, he wanted to expand on his business degree. Plus, he didn't have to leave the office. Liberty and Boston University have partnered to offer an on-site master's program at Liberty's training facility in Portsmouth.

"I don't think I would have gone for the degree when I did if it weren't for my job, so to speak," Broad says. In a typical week, he puts in 60 to 65 hours at work and 12 hours at school.

"I found that every new class I took directly helped me on the job," Broad says. One class "became, kick, punch and barrel, a course that I now teach for Liberty employees."

"Before I went into the program, I thought I understood how computers worked—and I did, to some degree," Broad says. "But now I have a much deeper, richer understanding from the ground up. So when I'm teaching people how some C++ code was implemented and someone asks why it was done that way, I can really go all the way to the root of the procedure and show that the decision starts with the way the hardware works and takes it from there."

Regional Scope: Minneapolis/St. Paul

Job fertility in the Twin Cities

Minneapolis and St. Paul offer one of the most fruitful job markets for IS professionals — By William Spain

Minnesota's Twin Cities of Minneapolis and St. Paul just might be the nation's most urbanized icebox. But the area's booming and diversified economy is experiencing a dearth of information systems skills that could warm any job seeker's heart. In fact, the only thing skilled IS professionals might find a bit cold is the cash they will be offered to sign on with companies in the Twin Cities.

According to Rick DesLauriers, a technical recruiter at ESP Systems Professionals, virtually every segment of Minneapolis/St. Paul's diversified economy is suffering from the lack of IS talent.

"We have strong manufacturing, retail and medical technology," DesLauriers says, and all of them face a "big-time shortage" of skilled workers.

Among the most immediate needs are people with expertise in C++, PowerSoft Corp.'s PowerBuilder and Microsoft Corp.'s Visual Basic Access. In addition, "the mainframe world is still very strong — Cobol and DB2 — because of all the legacy systems" still in place, DesLauriers says.

Ken Carter, vice president and chief information officer at Carlson Cos., a \$12 billion travel, hospitality and marketing services company, echoes that sentiment.

"It would probably be easier to identify the skills we aren't looking for," Carter says. "The market has been extraordinarily tight. The demand far exceeds the supply. We find ourselves using a lot of contracting companies and competing with them for qualified people."

Carlson is particularly in the market for "people with strong Oracle skills, as well as [World Wide] Web site development and multimedia," Carter says. "From there, it blows out to advanced client/server, Visual Basic, C++ and advanced development. At the same time, we are still looking for people who understand Cobol [and] the old mainframes. We have a big base of legacy systems to update and connect."

At advertising agency Campbell Mithun Esley, "communications and networking skills are the big ones," says Charles L. Kampa, vice president and director of MIS. "We are looking for people with good networking backgrounds and a

real good background in communications software."

Kampa says his agency "has been fairly fortunate" in meeting its personnel needs. "I talk to other people, and I know there is a very real demand and salaries are definitely escalating."

The key is the ability to design electronic-mail packages and knowledge of the Internet, intranets and networking. "If you have strength in these skills, you will not have a difficult time getting a job in this area," he says.

One of the things driving the red-hot local economy is the perception that the Twin Cities retain a quality of life matched by few other urbanized areas. The area has many of the arts, sports and entertainment options of larger cities, but no hellish commuters or overpriced housing. That kind of atmosphere may encourage new companies to come in to the market and those already there to stay. ■

Spain is a freelance writer in Chicago.



Who's got the jobs

The top employers in Minneapolis and St. Paul:

EMPLOYER	NUMBER OF EMPLOYEES
Minneapolis	
St. Paul	

Source: Minneapolis/St. Paul City Business: The Business Journal

Recruitment challenges rising

National flour company finds it takes longer to fill IS jobs

A classic American brand name, Pillsbury Co., provides a good overview of the type of skills needed to prosper in the Minneapolis/St. Paul area. In an interview, David Moran, manager of human resources for IS at the subsidiary of Grand Metropolitan PLC, talks about Pillsbury's employment situation.

QW: How does the local IS employment picture look?

MORAN: I see Minneapolis as being one of the tightest markets [for employees] in the nation for IS skills. It's the white-collar capital of the Midwest.

QW: Any specific skill sets you're looking for?

MORAN: We need people for SAP and Lotus Notes development, [electronic data interchange], data warehousing and most applications development.

QW: Is technical proficiency the main basis for a hire?

MORAN: We are starting to look for a much more well-rounded person. We are no longer looking for the programmer who can just sit at a cube and write code. We are moving to a team-based approach and need people who not only understand the systems but the business aspects.

QW: Can you describe your "dream hire"?

MORAN: The ideal candidate for Pillsbury is an MBA who might have an undergraduate degree in computer science or management information systems or have a high level of aptitude in systems.

QW: Overall, is Pillsbury seeing the IS staffing needs?

MORAN: Finding people in such a tight market isn't easy. We are generally meeting our needs, but the time frame it takes to find a qualified professional has lengthened. For instance, if we were to look for an EDI manager today, it would take at least two months to find the right, qualified person.

Pillsbury

Healthcare

With its unprecedented expansion and widening technological frontiers, healthcare is an emerging hotbed for IT professionals. SmithKline Beecham, a global leader in the pharmaceutical industry, is committed to bringing healthcare solutions to the world. At Diversified Pharmaceutical Services, Inc., a division of SmithKline Beecham, our patient volume has seen phenomenal growth from 15 million to 26 million lives in one year, and financial support is a reality as nearly one third of our budget is committed to IT. We offer careers in a wide range of technical areas including relational databases and 3-tiered client server architecture.

Progressive Industry

Entrepreneurial Environment

Impact on People's Lives

DIVERSIFIED[®]

SB
SmithKline Beecham

Senior Program Analysts Project Managers Senior Client/Server Developers Senior Client/Server Administrators Security Technical Analysts

- UNIX
- C++
- PowerBuilder
- COBOL
- DB2

Our Excellent Benefits Include:

- Immediate response
- Advancement opportunities
- 12 paid vacation days
- Merit and bonus
- Casual dress
- Pension/401k
- Tuition reimbursement
- Health/dental
- Flexible work schedule

To The Nth Degree

At Northwest Technical Services (NTS) we cultivate a deep understanding of Northwest businesses and align the latest technology to provide the optimum in training services and convenience. The innovation and hard work of our teams at NTS are an irreplaceable competitive advantage for Northwest and an important ingredient in our ability to always go to the nth degree for our customers.

We have fantastic opportunities for systems professionals AT ALL LEVELS who are geared up for the rewarding challenges of developing and deploying the technology to support our world class organizations into the next century.

MAINFRAME - UNIX - NETWORK - PC

In order to attract, develop and retain the most talented people, NTS has implemented job structures that provide career development alternatives for employees as well as a broad range of technical, managerial and professional development programs. We also provide a competitive compensation program and one of the most comprehensive benefits programs in the industry.

Please send your resume and salary requirements to:
Northwest Technical Services, Human Resources - Technical Recruiting, 280 2nd Avenue South, Minneapolis, MN 55479-1048. Fax (612) 667-0973.
E-mail: nts@nwts.com

For more information on Northwest visit our homepage at <http://www.nwts.com>.

TECHNICAL
SPECIALISTS

Minnesota... State Of The Art

At the State of Minnesota, information technology professionals enjoy the advantages of leading edge technologies and the freedom to achieve their full potential. Our professionals are key in supporting the services delivered by state and local levels of government.

Our is a truly diverse workplace with a variety of platforms and levels of responsibility. You can be an integral part of an organization that affects so many state residents. Right now, we're in staffing challenging projects statewide with experts skilled in the following:

■ Technical Support - IBM Mainframes, Unix/NT, LAN/WAN System Admin, Data Base Admin, Client/Server, Network Admin, A/S, Windows NT, Disaster Recovery, TCP/IP, JCL, User Omgangment, TMON, CA-7

■ Application Design/Development - Project Mgmt, Oracle, Adabas, dBase, SAS, SQL SERVER, COBOL, C++, PowerBuilder, Natural, Paradox, People, People Soft, Visual Basic, Lotus Notes, Microsoft Access, Word 2000

■ Information Management - Network Design, Network Operations, Fault Isolation, Network Element Management, System Admin, Digital, Backbone Network, Internet Support

You can make a statement in our culturally diverse, technically sophisticated environment. There are talented professionals for movement and career advancement within over 140 different state agencies. Along with opportunities to broaden your professional horizons, we offer attractive compensation, an extensive benefits package, including Health/Disability Life Insurance, Pension, Long-term Care, and Deferred Compensation, Tuition Reimbursement and Training and Development. For more information and application material, call Eric Wernberg at (612) 297-7860, TTY: (612) 297-3499 or E-mail: erick@nwts.com.

The State of Minnesota is Committed to the Ideal of Equal Opportunity.

Sponsored by the Minnesota Department of Administration, Employee Relations, Human Services, Revenue and Transportation.

Deluxe Technology

Deluxe Corporation is the world's largest check printer and a leading provider of electronic and paper-based payment systems and value-added services for financial institutions, retailers, and small businesses. In 1995, Deluxe recorded higher sales for the 57th consecutive year. Of 141 sales and this year consistently profitable since 1933. Please visit our home page at deluxe.com for additional information about our company.

We invite you to consider joining one of our many dynamic offices where we are looking for the following skills:

- SMALLTALK
- C and C++
- ORACLE
- COBOL
- POWERBUILDER
- SAS
- DB2
- CICS

Please send resume and employment correspondence to Deluxe Corporation (CWI), Central Employment, PO Box 64239, St. Paul, MN 55164. We require about additional opportunities, please call our job line at 612-481-4100.



DELUXE
ECONOMY EMPLOYMENT

SOFTWARE DEVELOPERS

The Trane Company, an innovative leader in air conditioning & building management services, seeks Software Developers with a BS degree in computer science, electrical engineering or related discipline to participate as a technical resource, architect, & software developer on multi-functional teams designing & developing PC based software applications.

Developers must have extensive knowledge of multi-threading/multi-tasking applications, experience in developing applications under Windows NT or Windows 95, & expertise in Visual BASIC/Visual C++ environments, OLE & MFC as well as familiarity with object oriented methodologies (OOA, OOD, OOP).

Experienced developers will have 3-5 years experience developing software professionals with 2-3 years in developing Windows software. Senior developers will have 5-10 years relevant software development, 4-5 years developing Windows software & be willing to perform as the technical lead architect in the definition of new software applications.

The Trane Company offers competitive salaries, attractive benefits, & ongoing opportunity for professional growth. Send your resume & cover letter by August 15 to: The Trane Company, HR/SD, 26 Yorktown Court, St. Paul, MN 55117, Attn: Human Resources. No phone calls please. All resumes will be responded to via U.S. Mail. Equal Opportunity/Affirmative Action Employer.

PROJECT MANAGERS PROGRAMMER ANALYSTS

Personnel Decisions International (PDI) is a human resources and management consulting organization with 17 offices in 8 countries. Our IS group is a growing state of the art software products that complement the services we provide our clients. We are using and exploring leading edge technologies including client/server, object oriented, client/server, and groupware. Our group is small (4-6 people), dynamic, & focused, and it loves challenges. We are looking for Technical Project Managers and Programmers/Analysts who are very bright, very motivated, very hardworking, and who have as part of a Windows/Visual Basic/Oracle/SQL/PL/SQL (a plus).

PDI offers a dynamic work environment, competitive pay, and excellent benefits. Please send a resume and indicate your interest and qualifications to: HR Director, Personnel Decisions International, 2900 Plaza NW Tower, 48 South 7th Street, Minneapolis, MN 55402, or via e-mail to cawen@pdi.com. We are an Equal Opportunity Employer.

PERSONNEL
DECISIONS



NOLA
COMPUTER
SERVICES

We are in our 11th year of providing quality service to Fortune 100 and government clients throughout the South. NICLA offers competitive compensation and comprehensive paid benefits. We are seeking professionals with experience in any of the following:

Assessing Treatment

- System implementation experience including:
 - PeopleSoft General Ledger, Payables, Receivables
 - Oracle Financials
- System design and analysis tools
- Project management

Technical Problems

- PeopleSoft - PeopleTools
- Oracle 7.x (DBAs and Application Developers)
- PowerBuilder 4.x with Oracle 7.x or Sybase
- Oracle Platforms
- SAS DBMS with COBOL II

Sched your service to: **NOLA Computer Services, Inc.**,
1100 Poydras St., Suite 1250, New Orleans, LA
70163; Toll Free 1(800) 347-1970 Fax (504) 585-3760
E-mail: nola@mailhost.earthlink.net

Beautiful Northern Michigan
MIS

Want to make your
Business *challenges*
become more than just
a challenge? Clean air,
weather preservation and
an excellent career
choice could be in your
future.

[illegible]

**MANAGER OF
SYSTEMS
DEVELOPMENT**

[illegible]

**INDIANA
UNIVERSITY
MEDICAL CENTER**

**INFORMATION
MANAGEMENT
SERVICES
ADMINISTRATOR**

197.750 200.813

[illegible]

the areas of data processing, and industrial controls, possession of excellent verbal and written communication skills, must become a City of Saginaw resident within 90 days from date of hire. Qualified applicants will be invited by an interview. Apply to Employee Services, Room 702, City Hall, 1315 S. Washington Ave., Saginaw, Michigan, 48601 (at reception) or by letter, August 15, 1990.

programmer. Analysis is open-ended. Plan device test & document computer programs requiring knowledge of program techniques & computer systems, evaluate user requests or new or modified programs, determine feasibility, cost & time required, compatibility with current system & computer capacity. Consult with user to identify current operating procedures & current programs objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert planned specifications into using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processor.

[illegible][illegible][illegible][illegible][illegible][illegible][illegible]

SAP Software Corporation is the world's leading provider of enterprise resource planning (ERP) solutions. SAP's software is used by more than 100,000 companies in over 120 countries. SAP's software is used by more than 100,000 companies in over 120 countries. SAP's software is used by more than 100,000 companies in over 120 countries.

[illegible][illegible][illegible]

Systems Analyst
All kinds of jobs
in the field of
computer
technology.
Call for
information.
1-800-368-5118
Circle 10

[illegible][illegible]

Programmer - 1,000 a.m. to 5:00 p.m. per week. Health Care application software for insurance. Available for program, develop, and setup of routines. IN. Training staff to use. Manage programmer. AS in Engineering. Experience in a year. Universities, UK, Basic, G and C, computer, legal authority. Opportunity to the SPANTEM SECURITY.

world's
Disk!
their staff
competitive
are paying
to use them.
right demand letters
computerized
legal principles in
1-800-455-0037

ATTEND



Computerworld's Washington D.C. Corporate Technical Recruiting Conference!

Monday, September 16, 1996
Fairview Park Marriott, Falls Church, Virginia

On September 16, 1996, you have a special opportunity to update your recruiting skills and network with recruiters in your area at the first-ever Washington, D.C. area Corporate Technical Recruiting Conference, held at the Fairview Park Marriott, Falls Church, Virginia.

A Full Schedule of Contemporary Topics

- | | |
|-------------------|--|
| 7:30 a.m. | Continental Breakfast
& Conference Registration |
| | Concurrent Sessions |
| | Proactive Recruitment
Techniques |
| 12:15 p.m. | Luncheon Keynote |
| | Repeat of
Concurrent Sessions |
| | Town Hall Forum |
| 6:00 p.m. | Program ends |

Selected sessions include:

Proactive Recruitment Techniques

Dore Drayman, President, Bay Cities Research, Inc.
To remain competitive, today's technical recruiters need to be aware of the latest trends in sourcing and proactive recruiting. This in-depth session from a leading expert will explore this critical topic and will help you put your mission and expectations into proper perspective.

Industry Trends

Luncheon Keynote Address
Marybeth Johnson, Executive Editor, Computerworld
Sure, there are new skills entering the market every day, but what are the trends that drive these skills? Marybeth Johnson, one of the industry's leading winners of the Information Systems professions will give you an up-to-the minute view on this very special keynote address.

Town Hall Forum

Gary Cliff, President, Cliff and Associates
In this session, you'll not only be able to propose your specific questions for open discussion, you'll learn of real world issues and solutions from your peers. You won't want to miss this rare opportunity as Gary Cliff, an expert in the HR field, leads us through this modern discussion of your recruiting topics.



COMPUTER PROFESSIONALS

**\$1000
SIGN ON BONUS**

UNIX C/C++ (20 needed)
INFORMIX UNIK C (24)
MSI CORP.
ORACLE ALL LEVELS
SYBASE ALL LEVELS
LAN ADMINISTRATORS
SYSTEMS TESTER/2

**PROJECTS LOCATED
IN NEW JERSEY**

Send resumes to:
COMPUTER EXPERTS, INC.
187 Route 118 South
Suite 3022
East Brunswick, NJ 08811

Call Harry (800) 214-2529
or fax (908) 214-2517



COMPUTERWORLD
9th Annual
Campus Edition

**Recruit
top I.T.
students
from top I.T.
Campuses!**

Issue Date: Oct. 31, 1996
Close: Sept. 18, 1996

COMPUTERWORLD
Campus Edition



Plan Now!
1-800-343-6474, x8201

9th

**Recruit top I.T.
students from top
I.T. Campuses!**

Issue Date: October 31, 1996
Close: September 18, 1996
Plan Now!
1-800-343-6474, x8201



Start your day...



COMPUTERWORLD
The Internet Connection for the IT Community

www.computerworld.com



<http://careers.computerworld.com>

Computer Careers

IBM GLOBAL NETWORK



Advantis, the U.S. provider of the IBM Global Network, one of the world's leading Internet and multi-protocol private network providers and customers, has more than 4,000 employees servicing more than 25,000 customers worldwide.

We have multiple positions now in our Schaumburg, IL and Western United States locations.

MULTI-PROTOCOL TECHNICAL SUPPORT

We have several openings for networking professionals who have a record of success with multi-protocol networking (MNP) technologies. We'll pay you to solve customer MNP requirements, build user confidence, and implement, test and verify end-to-end connectivity. Your credential must include a BS in CS, TC or MIS, at least 5 years' hands-on experience in a multi-protocol environment, and strong skills in the TCP/IP protocol suite, including RFP, OSPF and BGP4 routing protocols. Proven team and communication skills and the ability to accommodate a flexible work schedule are essential. Knowledge of Cisco and IBM routers and experience with Bay Network and other vendor routers are desirable.

FRAME RELAY/ATM TECHNOLOGY SUPPORT

Meet the challenges of evaluating and testing network equipment and features in a lab environment. Working in collaboration with equipment vendors, you'll integrate new features and equipment into the operational environment. We require experience in a variety of test equipment that relates to WAN, frame relay, ATM testing, AUI/SONET, Network 6000000 Operative, an electrical engineering background is recommended.

NETWORK TECHNICIAN

Advance your experience installing, testing and multi-protocol (MNP) routers using various network management tools. You'll respond to alerts and alarms, implement recovery actions and document all problem management system network activities, and manage problems from initial intervention to final resolution. This work will involve a high degree of contact with customers and vendors and will require excellent communication skills. To qualify, your background must include IBM, multi-protocol, LANs, WANs, T1/T3, Novell, AUI/SONET, and ideally an Engineering, Telecommunications or Computer Science degree.

PROJECT MANAGERS/EXECUTIVES

Your role in the development of IBM and multi-protocol private plans offers you team leadership responsibilities and the opportunity to manage and provide technical direction to professionals and vendors. We require a strong technical background in IBM and multi-protocol routers along with excellent interpersonal and communication skills.

In addition, we have positions available at which you will utilize your networking skills (DNA, NetWare, TCP/IP, etc.), Internet technologies, including World Wide Web, server programs (CGI, Perl, REXX, BGP4), and network management tools (Performance Manager).

If you are interested in a career-enhancing position and excellent compensation that includes a competitive salary and a comprehensive benefits package, please mail us your resume and all correspondence to: 888-486, 1708 E. Golf Rd., Suite 200, Schaumburg, IL 60197; FAX: 1-647-702-8105; email: advantis@ibm.com. Visit our website at <http://www.ibm.com/globalnetwork>. Also be advised information on current openings. We are committed to creating a diverse environment and proud to be an equal opportunity employer.

All responses must include position of interest and Job Ref: 6409LE0214.

advantis
U.S. Provider of IBM Global Network



MRTD Member

Contract & Perm. Available
System Admin (JHUX, AIX)
SAP Developers
Programmers - COBOL, Natural, Pick,
Visual Basic, C++, or Assembly
PC Help Desk, Tech Support,
Lotus Notes Developer & Admin

Send Resume to Client/WT
4417 Lakeside Rd. Overland, MO 63114
1-888-428-8300 ext 101 fax
1-816-231-1111 ext 200 FAX
OFFICES in 10 states

© 1996 MRC Systems, Inc.

Simply the BEST

OREGON

Help the Pacific Northwest prosper with the best of the BEST.
People who have seen development for centuries develop
to living solutions for complex systems require change.
Confident partnership with clients with clear focus. Generate
ideas - deliver the results - adjust focus, opportunities.
To learn how we can benefit from our small team, contact us
and return to:
BEST Consulting
200 E. Ashland, Suite 1100
Portland, OR 97232
(503) 734-5796 (503) 734-5796 fax
info@best.com
1-800-224-1286

*Full Time *Part Time
*Night *Weekend
*Relocation *Housing

I.T. Technical Support Services

Raytheon Service Company is one of the nation's largest and most successful providers of technical services to government and commercial clients. Our employees are working in more than 100 locations in seventeen countries, providing their expertise in systems engineering, site planning and preparation, installation and acceptance, training and technical support.

As you plan for the future, we are seeking proven I.T. Management and Technical Personnel, to help us develop new business in providing Information Technology Services to include Network Engineering, Planning and Installation (LAN/WAN), Network Administration, Software Development and Support and Telecommunications Engineering and Support.

Managers, I.T. Technical Support Operations

For this new business area, network candidates with BS/CS/SEE or equivalent and 10+ years' experience in developing and managing the overall operating functions of a medium to large scale computer service operation, with responsibility for computer/communications network maintenance, customer support, system software maintenance and computer operations.

Technical Support Personnel

As our I.T. Support Business grows, we continue to have current and anticipated opportunities for Technical Support professionals for the design, development, installation, test and support of network solutions in support of our various customer support areas nationwide.

- Network Engineers
- Telecommunications Systems Engineers
- Software Support Engineers
- Systems Engineers
- Database/OLAP Specialists
- Communications/Computer Network Technicians
- Computer Operators
- Network Managers and Administrators

If you have a proven track record in any of the above mentioned areas and want to take part in our growth, please send your resume to: Raytheon Service Company, 2 Wayland Road, Burlington, MA 01803 Attn: Employment Department CW/T or fax to (617) 236-2764. An Equal Opportunity Employer

Raytheon

TANDEM
CORP. RETIRED TO
SCHOOL, E. 500, N. 20
STATION
PL. COLUM, G. 010
MANAGEMENT
LAW, OF COURSE, GAY, CO.
RESEARCH, CO. - West Coast
Futures/Consulting, Telecom
Available in the US/AFRICA
STATION
1000-1000
TEL: (415) 877-8888
FAX: (415) 877-1888
EMAIL: info@tandem.com
1000 Jerome Ave.
Woodbury, NY 11797

SAP
We are in the process
of SAP professionals
and SAP consultants
who have been long
in the business and
permanently available.
We have no overhead so we
can offer you TOP rates.
People Unlimited
1808 South St. # 1103
Cincinnati, OH 45203
Phone: 703-661-1176
Fax: 703-661-1176

OUR PEOPLE
MAKE THE
DIFFERENCE...



All positions are located in our corporate offices in Bentonville, Arkansas, near the beautiful Ozark Mountains, Beaver Lake, and the University of Arkansas. In Northwest Arkansas you will discover a lifestyle that combines urban amenities, easy commuting, and a progressive atmosphere while retaining the feel of a small town living. Arkansas is a wonderful place to raise a family, and we ought to know: WAL-MART's corporate headquarters is one of the biggest and best in the nation.

Your opportunity to work in a dynamic, award-winning Information Systems Division awaits you. Both entry level and experienced professionals are encouraged to apply for positions within:
SBA franchisees, LPAS, PC workstation, computer graphics, networking, or telecommunications. Business experience in Grocery, Merchandising, Distribution, Retail/Store, Pharmacy or Optical is a plus.

Come and join the people that make a difference. We offer competitive salaries and benefits. If you are willing to begin a dynamic career with WAL-MART, please mail, fax or e-mail your resume to:

WAL-MART

WAL-MART Information Systems Division
Attention: Recruiting Dept. CW/S-9353
700 S. W. 8th Street
Bentonville, AR 72716-8000
Phone: (501) 277-3001 Fax: (501) 877-5555
Email: wwwrcout@wal-mart.com



(<http://careers.computerworld.com>) JULY 22, 1996 COMPUTERWORLD

Marketplace

Networks ready to take on new look

Design tools will give administrators new views of their domains

By Tom Duffy

Keeping track of the many components in client/server systems is a daunting task, even for the most well-organized network administrator. Distributed computing can translate into distributed purchasing, which means routers and servers can pop up anywhere, sometimes without the network administrator's knowledge.

An administrator of a small LAN might be able to carry around a mental picture of the network in his head. But administrators of large networks don't have that luxury. They need maps. Call it a necessary evil, but network mapping can facilitate troubleshooting, aid in the training of newly hired network specialists and pave the way for carefully planned network expansion.

A few years ago, decisions about network mapping products were relatively basic. Most network diagramming tools were simple graphics packages, not much different from presentation tools such as Microsoft Corp.'s PowerPoint. But the products have become far more powerful and now offer vast databases that allow detailed diagramming and "intelligent" features that prevent faulty connections from being built in to the map.

But the network diagramming market appears poised for a revolution. Coming soon are tools that allow "auto-discovery" — a network management function that seeks out, identifies and logs the network's components.

NetSuite Development in Wayland, Mass., plans to release by year's end a version of its NetSuite network design tool that will offer an auto-discovery function, says Brian

this wonderful visual representation of your environment that you can plan off of and optimize. And you won't have to spend 80% of your time keeping it up to date."

But it may not be easy to develop tools that collect all data from multiple management systems. "Part of the problem is that the topology data is being gathered in a completely different format from management system to management system so there is no easy way to study it into a single graphics program," says Tim Wilson, an analyst at Decays, Inc., a consultancy in Sterling, Va.

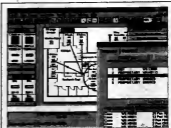
Wide-ranging choices

Network diagramming tools offer a dizzying spectrum of capabilities. Prices can reach \$7,000 or so for Command from Cambium Networks, Inc. in Santa Clara, Calif. Command is promoted as a network management package with diagramming capability.

The relatively young network diagramming tools market is changing rapidly, and diagramming capability is increasingly an adjunct to other network management tools.

Optimal Networks Corp. in Mountain View, Calif., known for its network traffic monitoring products, is poised this month to release Optimal Surveyor, which can feed network information into a separate diagramming tool. In this case NetViz from Qeyu Systems in Rockville, Md. Optimal officials say they hope to make Surveyor compatible with other diagramming tools.

All the developments are pushed by demand from network managers, Wilson says. "There is a great deal more emphasis being placed on network systems and application management," he says. "It's no longer just an issue of draw-



Auto-discovery of devices is on the way for products such as NetSuite



NetViz can map data collected by other management packages

ing a line from one router to another. You have to know the content of the individual systems involved and the applications running on the processor."

Systems integrators are a growing market for network diagramming tools, says John Morency, a principal at The Registry, Inc., a consultancy in Newton, Mass.

"The need to do this type of validation on an ongoing basis drops off sharply once the support staff has the experience," he says. "But it makes a lot of sense in terms of being able to reuse the function across a lot of users."

Duffy is a freelance writer in Somerville, Mass.

COMPUTERWORLD MARKETPLACE VENDOR CENTER

Get detailed product information direct from a variety of manufacturers — without leaving your desk.

A free service for our readers that's as easy as...

- 1 Call the Computerworld Marketplace Vendor Center at (800) 447-0018
- 2 Ask for the attention line in the product you want information on
- 3 To back and relax — your requested information is on the way.

(800) 447-0018

Software

3P/90 ESE Installation	ext. 317
Client/Server Development Tools	ext. 309
Groupware	ext. 311
Network Management	ext. 312
Personal Assistants	ext. 313
Personal Development	ext. 318

Computers/Peripherals

Back-up/Save/Recovery	ext. 316
Calculus/Books/Textbooks	ext. 320
Desktop PCs	ext. 301
Books	ext. 317
Hardware	ext. 315
Modems	ext. 319
Monitors	ext. 312
Peripherals	ext. 318
Project/Track	ext. 305
Repair & Maintenance	ext. 321
Security	ext. 318
Workstations	ext. 303

Networking/Communications

Client Server Tools	ext. 303
Desktop/Text/Database	ext. 320
Groupware	ext. 306
Internet Products/Services	ext. 324
Network Hardware	ext. 319
Network Management	ext. 307
Network Software	ext. 318
Networks/Arms	ext. 322
Security	ext. 322
Storage/Calculus/LAN Books	ext. 315
TCP/IP	ext. 326
Workstations	ext. 317

Services

Consulting/Contract	ext. 303
Programming	ext. 307
Business	ext. 308
Data Recovery	ext. 310
Customer Service	ext. 316
Consulting	ext. 304
Large System Outsourcing	ext. 309

Internet/Intranet

Application Development	ext. 320
Tools	ext. 305
Consulting	ext. 304
Security	ext. 322

PLACE

Premier Solutions

Go Direct For Great Presentations

GO DIRECTLY TO THE
SOURCE FOR THE
LOWEST PRICES AND
THE BEST SERVICE.



PROCOLOR 3080*

\$6499 Business Laptop*
21" Monitor
256 kb memory 15.5 in.
640 x 480 (256 x 480 compressed)



Presenting A Better Way.™

ONE

Government: (800) 497-4969
Resellers: (800) 736-6956
International: (340) 779-7901
Rental: (800) 736-6956

Fax: (340) 779-3299
Education: (800) 689-6676
<http://www.bowlight.com>

BEACON 2500

\$4999 Business Laptop*
21" Monitor
256 kb memory 15.5 in.

REVOLUTION

\$6499 Business Laptop*
21" Monitor
256 kb memory 15.5 in.
640 x 480

PROCOLOR 2001

\$4999 Business Laptop*
21" Monitor
256 kb memory 15.5 in.
640 x 480 (256 x 480 compressed)

PROCOLOR 1820

\$2499 Business Laptop*
21" Monitor
128 kb memory 15.5 in.
640 x 480

TO ORDER, CALL

1 800 762 5757

Monday - Friday, 9am - 5pm PST. Purchase orders accepted.

Prices subject to change. Quantities may be limited to stock on hand.

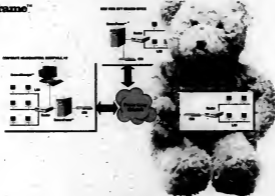
IS YOUR FRAME RELAY NETWORK INSECURE?

Secure it with SecureFrame™

You can save a bundle by moving to frame relay. But your network becomes less secure as you transmit sensitive data over a shared environment.

SecureFrame from Cylink Corporation is the only security product offering internationally-recognized information security standards for Privacy, Integrity and Authentication.

SecureFrame's superior network management combines ready compatibility with long-term scalability across any public or private frame relay network. Security policy management enables a virtual private network (VPN) utilizing flexible, fully-automated key management. The unit is easy to maintain and operates transparently, having no noticeable impact on users, applications, or network performance.



Delivering network security since 1984

Cylink has been the leader in WAN security since 1984, providing a complete line of network security products which combine hardware and software into a single package. Twelve years and thousands of installed security devices later, Cylink's reputation for reliability, service, and support remains unsurpassed among Fortune 500 companies, financial institutions, and government agencies.

Don't wait... move to frame relay and save. Call Cylink today or visit our web site.

CYLINK

Cylink offers sales and service through a worldwide network of direct sales and business partners.

910 Harwood Court, Sunnyvale, California 94086 Tel: 408-735-0800 Fax: 408-735-8274
Fax on Demand: (USA) 800-735-6614 (R237) (Intl) 408-735-6614 (R237) Email: info@cylink.com <http://www.cylink.com/>

Finish Out Your Rack with a Magnum Commander

- Control up to 96 file servers with 1 keyboard, mouse and mouse
- AutoBoot™ feature boots all computers without user intervention
- 3.5" unit is designed for 19, 23, and 24" rack applications
- Each unit controls up to 16 file servers; cascade up to 6 units
- Push-button and keyboard controlled scanning standard
- Supports all 100% IBM compatible PCs and PS/2 or serial mice; integral Sen and optional Mac support available
- Control all attached computers locally, remotely, or both; rear peripheral access available



***** COMMANDER™

Cyber Computer Products Corporation
4912 Research Drive
Huntsville AL 35895 USA
1-800-932-9239 (205) 430-4030 fax
<http://www.cyber.com>



IBM, PC and PS/2 are registered trademarks of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc. Sen is a trademark of Sen Microsystems. The PC 286 logo is a registered trademark of Gateway Group. Cyber, Commander, and AutoBoot are trademarks of Cyber Computer Products Corporation.

Bestor Program Available

Made in the USA

X Your best choice for mainframe computing services

REMOTE

COMPUTING

Extensive Software Library

Advanced Conspicuous Tynet Internet and WWW Services

Year 2000 Conversion/Testing Platform

Enterprise Customer Service

Complete Migration Management

info@faneuil.net

MVS/ESA IMS/DBDC
VM/ESA CICS SAS
VSE/ESA TSO DB2

**FANEUIL
SYSTEMS**

706-574-3636

815 Commerce Drive, Oak Brook, IL 60021

ENTERPRISE CONNECTIVITY with **HYPERA-2000**

direct channel-oriented multi-
protocol gateway/controllers

**Mainframe LAN
Local & Remote
ASCII Access
Dial-Up Gateway**

- Block or Byte Channel Attached
- Up to 256 Async Ports/16 LANs
- SNA and Non-SNA Gateway PU
- Modular Design for Easy Expansion

1-800-554-9372

<http://www.farni.com>



Software • Hardware • Networking • Services

I'll get back to
you
later!!



(If I can only get the information I want!!)

Distribute Your Corporate Data With: **info LING**

Your Mobile Intranet

- Automatically Distribute HTML (www), Word Processing, Spreadsheets, Presentation, Graphics, Multi-Media Documents.
- Set Expiration Dates, Automatically Build Indefers for Your Users, Use Std. Browsers.
- Supports NT, Windows 95, Dos, OS/2.
- Supports Up to 32 Simultaneous Users Per Server.

- Automatic Synchronization of Files
- Also: Sends and receives files or programs for other applications automatically.

1-800-646-5434 <http://www.thinq.com>
(818) 750-1350 info@thinq.com

ALICOMP/CUBS

Has a SMALL BUSINESS DIVISION which has serviced over 165 diverse clients. It specializes in providing VM, MVS, VSE service to clients who need:

- OUTSOURCING (Up to 10 MIPS)
- REMOTE COMPUTING
- TAPE CONVERSIONS

• SYSTEMS INTEGRATION CONSULTING

• YEAR 2000 SERVICES: Impact Studies and Automated Tools

- Industry experience includes:
 - Financial Services
 - Non Profit
 - Software Developers
 - Healthcare
 - Manufacturing
 - Distributing
 - Publishing

We are the "Boutique" of the Computer Services World

(201) 319-8787 • (800) 274-5556

GET HELP!

Mainframe • AS/400 • Client/Server

- Data Center Facilities
- Remote Support
- Networking
- Desktop
- Technical Assistance
- Internet



AmiQuest
470 East Paces Ferry Road
Atlanta, GA 30328

YOUR PARTNER IN MANAGING INFORMATION TECHNOLOGY

COMPUTERWORLD MARKETPLACE gets your message in front of the right buyers

- 54% have made a purchase within the last 3 months.
- 52% look at the Marketplace section for the advertisements.
- It's where they shop!*

Source: Computerworld Marketplace Study: ICG Research Services Group, Oct. '96

Call today to get your message across! (800) 343-6474, ext. 7744

**COMPUTERWORLD
PLACE**

The New York City FINANCIAL INFORMATION SERVICES AGENCY is releasing a Bid Package for the acquisition of a total of (3) two Refurbished IBM 3900-001 or 3900-001 Enhanced Non-Impact Printers to be provided to the Financial Information Services Agency (FISA). Requests for this Bid Package may be obtained by calling Madeline Arnsbrong at (212) 906-3920. Further details regarding the specifications may be within the Bid Package. The Pre-Bid Conference will be held on August 1, 1996 at 11:00 am.

The City of Grand Rapids, Michigan is seeking qualified bidders for the purchase of a comprehensive Payroll/Personnel System that will run on an IBM 9221-170 Mainframe with VM/ESA and VSE/ESA operating systems.

Proposed system must have a remote report generator and capability of interfacing with Peat Marwick FAMS and ADPRS accounting software.

Interested bidders who wish to be considered for this opportunity should provide a written request on company letterhead to:

Payroll/Personnel Systems
City of Grand Rapids
Room 810
300 Monroe, NW
Grand Rapids, MI 49503

The written request should provide general information regarding your software's capabilities, information on where currently installed would be helpful but not a requirement at this time.

Responses should be postmarked not later than October 1, 1996.

Is Your Organization Ready for the Year 2000?

We offer:

- Full Conversion Strategy
- Assessment/Planning
- Supervision/Conversion/Testing
- Flat fee, low rates
- Off Site Development
- Automated Tools, Human Resources
- Specialized COBOL Technicians
- Previous Experience Year 2000 Conversion

You are one of your business, we'll take care of the conversion! Don't wait until 1999. Call us now for a FREE plan.

ISC Corp. Ite, New York
(800) 256-1336

DOUBLE Your Purchase Power!

We sell and lease refurbished

STRATUS
WYSE
TELEVIDEO
DEC
IBM

at HALF the price of new

800-410-6161

Computer Hardware Resources, Inc.
www.chrhq.com

COMPUTERWORLD
Internet Resource
Directory

SURF'S UP AGAIN

In the pages of

Ride the Wave

Back by popular demand, the September edition of Computerworld's Internet Resource Directory offers you a targeted opportunity to get your Internet/intranet product or service in front of IS buyers. For as low as \$250 you get:

- Exposure to Computerworld's audience of over 145,000 IS professionals
- plus*
- Bonus trade show distribution
- On-line exposure in Computerworld TechCity

Place your ad and listing today: 800-343-6474, ext. 7744.

Bound in the September 16 issue of Computerworld
Ad Close: July 26 • Material Close: August 12

COMPUTERWORLD
Everything you need to know

Advertisers Index

Acer America	62-63	Lucent Technologies	30-31
http://www.acer.com		McAfee	80
AST Computer	47	http://www.mcafee.com	
http://www.ast.com		Micro Focus	11
Cayenne Software Inc.	43	http://www.microfocus.com	
http://www.cayennesoft.com		(800) 872-6265	
Compaq Computer Corp.	41-45	Micron	58
http://www.compaq.com		http://www.micron.com	
Computer Associates	3	Microsoft	34-35, 70-71
http://www.cai.com		http://www.microsoft.com	
Compuware	22-23	NEC Technologies	32
http://www.compuware.com		http://www.nec.com	
Digital Equipment Corp.	9, 82-83	NetManage	40
http://www.digital.com		http://www.netmanage.com	
Exabyte	74-75	Nokia Display Products	15
http://www.exabyte.com		http://www.nokia.inteltech.com	
Fujitsu	64	(800) BYNOKIA	
Gates in Kind America	52	Object Management Group	20
Hitachi	38	Oracle Corp.	5
IBM	25-27, 56-57, 68, 76	http://www.oracle.com	
http://www.ibm.com		Powersoft	13
Information Builders	51-53	http://www.powersoft.com	
http://www.ibi.com		SAS Institute	18-19
Informa Software	21	http://www.sas.com	
http://www.inform.com		SCO	48
Innovation Data Processing	5	http://www.sco.com	
Internet Commerce Etc.	73	Seer Technology	CA
Inprinet Series	32/33	http://www.seer.com	
JD Edwards	108	Softtek Expos	84
http://www.jdedwards.com		Sun Microsystems	17
Lantron Software	55	http://www.sun.com	
http://www.lantron.com		Vantast	28
(800) 477-1357		Vista Software	10

To have your Internet address listed here, please contact Paula Wright at (800) 628-7776.

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

Computerworld, P.O. Box 2043, Madison, Ohio 42202-2042

Your magazine subscription label is a valuable source of information for you and us. You can begin by attaching your magazine label here, or copy your name, address, and coded line if it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc., should be accompanied by your address label if possible, or by a copy of the information which appears on the label, including the coded line. Your new address (and name) Address shown: J. Home J. Business

State _____
 Country _____
 Address _____
 City _____ State _____ Zip _____

Other Questions and Problems

It is better to write to us concerning your problem and include the magazine label. Also, address changes are handled more effectively by mail. However, should you need to reach us directly the following toll-free numbers are available: 1-800-688-1002 (toll-free U.S. and Canada) 1-800-363-3220 (computer members can reach us at a discount rate) (24/7) 1-800-363-3220 (Internet address: www.computerworld.com)

Computerworld's editorial information and other correspondence can be mailed to the editorial offices at the following address: Computerworld, 10000 E. Harvard Ave., Suite 200, Denver, CO 80231

Computerworld, Inc.

CEO/President	Executive Vice President	Senior Vice President	Vice President	Executive Assistant to the CEO
Gary J. Smith	James J. Watt	Matthew C. Smith	James C. Potts	Karen L. Chubb

Computerworld

An IDC Company: The World's Leader in Information Services on Information Technology

Computerworld Headquarters: 500 Old Connecticut Pk., P.O. Box 1171, Framingham, MA 01701-9171
 Phone: 508-475-0700, FAX: 508-475-4304

Editor	Vice President/Sales	Vice President	Vice President
Paul L. Loh	David D'Amico	Robert L. Winters	Cal Colcord

PUBLISHER'S OFFICE: Assistant to the Publisher/Executive Assistant: Margaret J. Doyle, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Sales Offices

Assistant Publisher/President: David P. Smith
 Computerworld Headquarters: 500 Old Connecticut Pk., P.O. Box 1171, Framingham, MA 01701-9171
 Phone: 508-475-0700, FAX: 508-475-4304

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Regional Vice President/Editor: David P. Smith, Senior Manager; Marketing Communications: Elizabeth Phillips, Manager; Trade Show & Conventions: Andrew Ashby, Marketing Manager; Susan Thayer, Marketing Communications; Product Manager: Karen Lohs, Marketing Specialist; Emily Dwyer, Administrative Assistant; Tracy White, Circulation Director; Computer Management Specialist; PRODUCTION: Production Director/Christopher J. Conner, Production Manager; Beverly Wolf, BLSB Classification Director; Operations Director/Emily Doyle, BLSB Classification Director; Manager: John Winkler, Traffic Manager; The Walker INFORMATION SYSTEMS: Vice President of IS/Wirelessly: Emily Doyle

Wang works its
way back, too

Finance & Investing

Next week: Hunting
for bargain-basement
technology stocks

Investor's Bookshelf

Investor's Guide to the Net: Making

Money Online

by Paul B. Farrell (John Wiley & Sons, Inc., New
York, 386 pages, \$24.95, paperback)



This book doesn't deliver on the promise of its title. It is a collection of previously published information about a wide variety of financial and investment information and services available via the Internet, online services and print and broadcast media. The book doesn't offer any guidance whatsoever: It neither points readers to the best sites nor advises them on what to do to make money. In fact, parts of the text seem to have been lifted wholesale from press releases promoting certain companies' products and services. Particularly annoying are the biased sidebar, which seemed designed merely to add to the page count of the book. Some are excerpts of old newspaper and magazine articles about the Internet and investing. Others are taken verbatim from advertisements from online service providers and publishers. An unfortunate oversight of this so-called guide is the lack of any sort of URL listing. The author doesn't even include phone numbers and addresses of the companies mentioned.

The Red Herring Guide to the Digital Universe

By the editors of The Red Herring Magazine

(Warner Books, New York, 496 pages, \$27.95, hardcover)



This tome isn't exactly a guide, either, but it is a valuable resource and reference for anyone investing in the communications, computer and broadcast industries, now in the throes of converging. The first third of the book consists of 11 chapters on various technology segments, including the Internet. Each chapter is a general overview of the technology, geared more for the average investor than the technologically sophisticated. The rest of the book—a full 300 pages—consists of profiles of companies deemed to be the "shining stars of the digital universe." The companies were chosen based on their influence in the digital universe, management team, financial resources, market dominance and market potential. Each one-page profile lists the company's address, phone, fax, E-mail, Web site, senior management, stock exchange and symbol and key financials such as revenues and earnings per share. Also included are descriptions of the company's products and market strategy. As is true of any analog guide, some of the company profiles were outdated as soon as the book was published; similarly, several have changed status by going public or being acquired. —Jim Harbert

the 'NET IMPERFECT ION ON IPOs

By Mark H. Sherman

How can Internet-related companies launch such successful initial public offerings (IPO) when they have limited or no operating history or revenue? Even more important, how should you evaluate such companies as investment opportunities?

The Internet/intranet business appears to have unlimited potential. Marshall Senk, our chief Internet research analyst, says Internet subscriptions will grow from 50 million, in 1995 to more than 280 million by the year 2000. More significant, Senk sees the Internet as a moneymaker, estimating that Internet-related revenue will increase from \$2 billion in 1995 to at least \$40 billion by the year 2000. Such potential has been sufficient to attract flocks of investors to anything Internet-related, and it has changed the ground rules for how and when these companies can go public. But with numerous Internet investment opportunities hitting the market every day, identifying and investing in them becomes tricky.

In the past, investment bankers and investors alike could get too accurate indication of how successful a software IPO would be based on how well the company met established IPO criteria. The common practice has been to look at two factors: predictability and valuation. But the Internet puts a new twist on how investors must consider these factors.

Predictability relates to the degree to which investors feel confident in a company's business model and its ability to meet performance goals. Historical measures of a company's predictability include significant market opportunity, strong competitive position, proven customer acceptance, strong strategic relationships, high-quality and experienced management and a proven financial model with four to five-year track record of profitability. But Internet companies are far less predictable. With the recent success of many early-stage Internet IPOs, investors

have become more anxious to invest in companies at a more conceptual stage. The measures of predictability in this environment have been altered to include a core Internet-related technology, product or service with significant market opportunity; strategic relationships with businesses that will imbue the company with an "Internet-savvy" seal of approval; high-quality and experienced management; and significant Internet revenue anticipated by 1997.

Valuation methods have also changed for Internet-related companies. Typically in the software industry, companies that have market capitalizations greater than \$75 million and public stock in excess of \$25 million meet the minimum requirement for an institutional investor-grade IPO.

While, historically, most stocks have been priced based on projected price-to-earnings ratios, most Internet company IPOs are being priced as a multiple of estimated calendar 1997 revenue, typically ranging from 7 times to 11 times and averaging around 9 times. This valuation methodology ignores Internet companies' operating histories, which often show little revenue, and enables the "average" Internet software company with revenue of less than \$100 million in 1996 and approximately \$25 million in 1997 to go public with a trading market capitalization of about \$280 million.

The new predictability and valuation parameters have worked for investors in the short term, but only time will tell whether they are accurate reflections of these companies' worth.



Sherman is a principal at Robertson, Sherman & Co., an investment banking firm in San Francisco. He heads the company's Software Banking Group and can be reached at (415) 781-9700 or mark_sherman@rsc.com.

The Losers in Stocks

Losers

Stock	Change	Price
Platinum Resources	-14.3	24.0
Brookfield Technology	-12.0	20.0
Intercept Corp.	-10.0	15.0
Advanced Technology	-9.0	12.0
Computer Resources	-8.0	10.0
Software Systems	-7.0	9.0
Computer Corp.	-6.0	8.0
Computer Systems	-5.0	7.0
Computer Services	-4.0	6.0
Computer Products	-3.0	5.0
Computer Equipment	-2.0	4.0
Computer Supplies	-1.0	3.0

Stock	Change	Price
Microsoft Corp.	-0.12	10.88
Lotus Development Corp.	-0.10	10.75
Novell Inc.	-0.08	10.62
Oracle Corp.	-0.06	10.49
Sun Microsystems Inc.	-0.04	10.36
IBM Corp.	-0.02	10.23
Compaq Computer Corp.	-0.01	10.10

Industry Almanac

Wang redux

Formerly one of the hardware titans in the Boston area, Wang Laboratories, Inc. (NASDAQ:WANG) has emerged from a long, hard fall to become a more focused software and integration company.

"There's a lot of value hidden in this company," says Tom Browne, vice president at Prudential Securities Inc. in New York. Browne recommends a buy. The stock held \$30 within 12 to 18 months, says Wang. \$1 billion in revenue comes from its network integration, workflow and imaging software, and the maintenance and support of its VS systems and software. The firm's continued success depends on how well it can grow business in the first two areas and manage the decline in its VS business, analysts say.

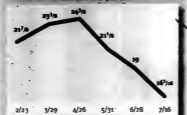
Wang is trying to grow its network integration business internally and through acquisitions, Browne says. The firm also wants to continue the growth of its workflow and imaging software business, which increased more than 100% in the past three quarters and now stands at \$45 million to \$50 million.

That growth is partly due to Wang's partnership with Microsoft Corp. (NASDAQ:MSFT), which last year bought 10% of Wang and started to incorporate its very technology into Windows 95 and Windows NT, Browne says.

Wang's VS business is declining at a rate of 22% a year and is being well-managed by the firm, says Patrick Mason, a research analyst at Value, Welch & Co. in San Francisco. But an acceleration in that rate of decline could be trouble, because the VS segment still brings in significant revenue. — *Tom Herbst*

It's all relative

Even with its recent drop, Wang has outperformed the rest of the technology stocks fairly well compared with other companies.



Stock 12-Month Return

Stock	Change	Price
COMP	15.4	12.4
IBM	14.8	11.8
MSFT	14.2	11.2
ORCL	13.6	10.6
WANG	13.0	10.0
INTC	12.4	9.4
HP	11.8	8.8
QCOM	11.2	8.2
TXN	10.6	7.6
AMD	10.0	7.0
SGS	9.4	6.4
ADI	8.8	5.8
LSI	8.2	5.2
SGS	7.6	4.6
SGS	7.0	4.0
SGS	6.4	3.4
SGS	5.8	2.8
SGS	5.2	2.2
SGS	4.6	1.6
SGS	4.0	1.0
SGS	3.4	0.4
SGS	2.8	-0.2
SGS	2.2	-0.8
SGS	1.6	-1.4
SGS	1.0	-2.0
SGS	0.4	-2.6
SGS	-0.2	-3.2
SGS	-0.8	-3.8
SGS	-1.4	-4.4
SGS	-2.0	-5.0
SGS	-2.6	-5.6
SGS	-3.2	-6.2
SGS	-3.8	-6.8
SGS	-4.4	-7.4
SGS	-5.0	-8.0
SGS	-5.6	-8.6
SGS	-6.2	-9.2
SGS	-6.8	-9.8
SGS	-7.4	-10.4
SGS	-8.0	-11.0
SGS	-8.6	-11.6
SGS	-9.2	-12.2
SGS	-9.8	-12.8
SGS	-10.4	-13.4
SGS	-11.0	-14.0
SGS	-11.6	-14.6
SGS	-12.2	-15.2
SGS	-12.8	-15.8
SGS	-13.4	-16.4
SGS	-14.0	-17.0
SGS	-14.6	-17.6
SGS	-15.2	-18.2
SGS	-15.8	-18.8
SGS	-16.4	-19.4
SGS	-17.0	-20.0
SGS	-17.6	-20.6
SGS	-18.2	-21.2
SGS	-18.8	-21.8
SGS	-19.4	-22.4
SGS	-20.0	-23.0
SGS	-20.6	-23.6
SGS	-21.2	-24.2
SGS	-21.8	-24.8
SGS	-22.4	-25.4
SGS	-23.0	-26.0
SGS	-23.6	-26.6
SGS	-24.2	-27.2
SGS	-24.8	-27.8
SGS	-25.4	-28.4
SGS	-26.0	-29.0
SGS	-26.6	-29.6
SGS	-27.2	-30.2
SGS	-27.8	-30.8
SGS	-28.4	-31.4
SGS	-29.0	-32.0
SGS	-29.6	-32.6
SGS	-30.2	-33.2
SGS	-30.8	-33.8
SGS	-31.4	-34.4
SGS	-32.0	-35.0
SGS	-32.6	-35.6
SGS	-33.2	-36.2
SGS	-33.8	-36.8
SGS	-34.4	-37.4
SGS	-35.0	-38.0
SGS	-35.6	-38.6
SGS	-36.2	-39.2
SGS	-36.8	-39.8
SGS	-37.4	-40.4
SGS	-38.0	-41.0
SGS	-38.6	-41.6
SGS	-39.2	-42.2
SGS	-39.8	-42.8
SGS	-40.4	-43.4
SGS	-41.0	-44.0
SGS	-41.6	-44.6
SGS	-42.2	-45.2
SGS	-42.8	-45.8
SGS	-43.4	-46.4
SGS	-44.0	-47.0
SGS	-44.6	-47.6
SGS	-45.2	-48.2
SGS	-45.8	-48.8
SGS	-46.4	-49.4
SGS	-47.0	-50.0
SGS	-47.6	-50.6
SGS	-48.2	-51.2
SGS	-48.8	-51.8
SGS	-49.4	-52.4
SGS	-50.0	-53.0
SGS	-50.6	-53.6
SGS	-51.2	-54.2
SGS	-51.8	-54.8
SGS	-52.4	-55.4
SGS	-53.0	-56.0
SGS	-53.6	-56.6
SGS	-54.2	-57.2
SGS	-54.8	-57.8
SGS	-55.4	-58.4
SGS	-56.0	-59.0
SGS	-56.6	-59.6
SGS	-57.2	-60.2
SGS	-57.8	-60.8
SGS	-58.4	-61.4
SGS	-59.0	-62.0
SGS	-59.6	-62.6
SGS	-60.2	-63.2
SGS	-60.8	-63.8
SGS	-61.4	-64.4
SGS	-62.0	-65.0
SGS	-62.6	-65.6
SGS	-63.2	-66.2
SGS	-63.8	-66.8
SGS	-64.4	-67.4
SGS	-65.0	-68.0
SGS	-65.6	-68.6
SGS	-66.2	-69.2
SGS	-66.8	-69.8
SGS	-67.4	-70.4
SGS	-68.0	-71.0
SGS	-68.6	-71.6
SGS	-69.2	-72.2
SGS	-69.8	-72.8
SGS	-70.4	-73.4
SGS	-71.0	-74.0
SGS	-71.6	-74.6
SGS	-72.2	-75.2
SGS	-72.8	-75.8
SGS	-73.4	-76.4
SGS	-74.0	-77.0
SGS	-74.6	-77.6
SGS	-75.2	-78.2
SGS	-75.8	-78.8
SGS	-76.4	-79.4
SGS	-77.0	-80.0
SGS	-77.6	-80.6
SGS	-78.2	-81.2
SGS	-78.8	-81.8
SGS	-79.4	-82.4
SGS	-80.0	-83.0
SGS	-80.6	-83.6
SGS	-81.2	-84.2
SGS	-81.8	-84.8
SGS	-82.4	-85.4
SGS	-83.0	-86.0
SGS	-83.6	-86.6
SGS	-84.2	-87.2
SGS	-84.8	-87.8
SGS	-85.4	-88.4
SGS	-86.0	-89.0
SGS	-86.6	-89.6
SGS	-87.2	-90.2
SGS	-87.8	-90.8
SGS	-88.4	-91.4
SGS	-89.0	-92.0
SGS	-89.6	-92.6
SGS	-90.2	-93.2
SGS	-90.8	-93.8
SGS	-91.4	-94.4
SGS	-92.0	-95.0
SGS	-92.6	-95.6
SGS	-93.2	-96.2
SGS	-93.8	-96.8
SGS	-94.4	-97.4
SGS	-95.0	-98.0
SGS	-95.6	-98.6
SGS	-96.2	-99.2
SGS	-96.8	-99.8
SGS	-97.4	-100.4
SGS	-98.0	-101.0
SGS	-98.6	-101.6
SGS	-99.2	-102.2
SGS	-99.8	-102.8
SGS	-100.4	-103.4
SGS	-101.0	-104.0
SGS	-101.6	-104.6
SGS	-102.2	-105.2
SGS	-102.8	-105.8
SGS	-103.4	-106.4
SGS	-104.0	-107.0
SGS	-104.6	-107.6
SGS	-105.2	-108.2
SGS	-105.8	-108.8
SGS	-106.4	-109.4
SGS	-107.0	-110.0
SGS	-107.6	-110.6
SGS	-108.2	-111.2
SGS	-108.8	-111.8
SGS	-109.4	-112.4
SGS	-110.0	-113.0
SGS	-110.6	-113.6
SGS	-111.2	-114.2
SGS	-111.8	-114.8
SGS	-112.4	-115.4
SGS	-113.0	-116.0
SGS	-113.6	-116.6
SGS	-114.2	-117.2
SGS	-114.8	-117.8
SGS	-115.4	-118.4
SGS	-116.0	-119.0
SGS	-116.6	-119.6
SGS	-117.2	-120.2
SGS	-117.8	-120.8
SGS	-118.4	-121.4
SGS	-119.0	-122.0
SGS	-119.6	-122.6
SGS	-120.2	-123.2
SGS	-120.8	-123.8
SGS	-121.4	-124.4
SGS	-122.0	-125.0
SGS	-122.6	-125.6
SGS	-123.2	-126.2
SGS	-123.8	-126.8
SGS	-124.4	-127.4
SGS	-125.0	-128.0
SGS	-125.6	-128.6
SGS	-126.2	-129.2
SGS	-126.8	-129.8
SGS	-127.4	-130.4
SGS	-128.0	-131.0
SGS	-128.6	-131.6
SGS	-129.2	-132.2
SGS	-129.8	-132.8
SGS	-130.4	-133.4
SGS	-131.0	-134.0
SGS	-131.6	-134.6
SGS	-132.2	-135.2
SGS	-132.8	-135.8
SGS	-133.4	-136.4
SGS	-134.0	-137.0
SGS	-134.6	-137.6
SGS	-135.2	-138.2
SGS	-135.8	-138.8
SGS	-136.4	-139.4
SGS	-137.0	-140.0
SGS	-137.6	-140.6
SGS	-138.2	-141.2
SGS	-138.8	-141.8
SGS	-139.4	-142.4
SGS	-140.0	-143.0
SGS	-140.6	-143.6
SGS	-141.2	-144.2
SGS	-141.8	-144.8
SGS	-142.4	-145.4
SGS	-143.0	-146.0
SGS	-143.6	-146.6
SGS	-144.2	-147.2
SGS	-144.8	-147.8
SGS	-145.4	-148.4
SGS	-146.0	-149.0
SGS	-146.6	-149.6
SGS	-147.2	-150.2
SGS	-147.8	-150.8
SGS	-148.4	-151.4
SGS	-149.0	-152.0
SGS	-149.6	-152.6
SGS	-150.2	-153.2
SGS	-150.8	-153.8
SGS	-151.4	-154.4
SGS	-152.0	-155.0
SGS	-152.6	-155.6
SGS	-153.2	-156.2
SGS	-153.8	-156.8
SGS	-154.4	-157.4
SGS	-155.0	-158.0
SGS	-155.6	-158.6
SGS	-156.2	-159.2
SGS	-156.8	-159.8
SGS	-157.4	-160.4
SGS	-158.0	-161.0
SGS	-158.6	-161.6
SGS	-159.2	-162.2
SGS	-159.8	-162.8
SGS	-160.4	-163.4
SGS	-161.0	-164.0
SGS	-161.6	-164.6
SGS	-162.2	-165.2
SGS	-162.8	-165.8
SGS	-163.4	-166.4
SGS	-164.0	-167.0
SGS	-164.6	-167.6
SGS	-165.2	-168.2
SGS	-165.8	-168.8
SGS	-166.4	-169.4
SGS	-167.0	-170.0
SGS	-167.6	-170.6
SGS	-168.2	-171.2
SGS	-168.8	-171.8
SGS	-169.4	-172.4
SGS	-170.0	-173.0
SGS	-170.6	-173.6
SGS	-171.2	-174.2
SGS	-171.8	-174.8
SGS	-172.4	-175.4
SGS	-173.0	-176.0
SGS	-173.6	-176.6
SGS	-174.2	-177.2
SGS	-174.8	-177.8
SGS	-175.4	-178.4
SGS	-176.0	-179.0
SGS	-176.6	-179.6
SGS	-177.2	-180.2
SGS	-177.8	-180.8
SGS	-178.4	-181.4
SGS	-179.0	-182.0
SGS	-179.6	-182.6
SGS	-180.2	-183.2
SGS	-180.8	-183.8
SGS	-181.4	-184.4
SGS	-182.0	-185.0
SGS	-182.6	-185.6
SGS	-183.2	-186.2
SGS	-183.8	-186.8
SGS	-184.4	-187.4
SGS	-185.0	-1

INTRODUCING
CONFIGURABLE
NETWORK COMPUTING.

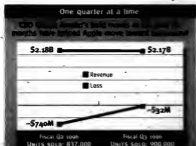
NOW YOU CAN GET
BACK TO RUNNING
YOUR BUSINESS.

INSTEAD OF
YOUR SOFTWARE.

J.D. Edwards is proud to introduce a remarkable new software architecture called Configurable Network Computing,* or CNC. Available only in our OneWorld™ enterprise-wide software, CNC masks the complexities found in client/server systems, so you can focus on more important matters, like managing your business. Now you can dynamically configure and reconfigure everything from workflow to business objects to data warehouses to the graphical user interface.

*Without writing a single line of code. Best of all, OneWorld with CNC will work with UNIX, Windows NT, OS/400, and MVS, as well as the leading SQL databases. And it's only from J.D. Edwards, a leader in business solutions, with almost 4,000 customers in more than 90 countries. For a free white paper, call 1-800-722-5333. Or visit www.jdedwards.com.

JD Edwards



Apple sees lighter shade of red

CEO Amelio's moves credited with stabilizing slide, easing user fears

By Lisa Picarile

Apple Computer, Inc.'s financial fiasco may be winding down. Despite posting a \$32 million loss for its third fiscal quarter, users and analysts seem pleased with the Cupertino, Calif., company's efforts to reverse its financial slide.

The loss for the quarter, ended June 28, is a drop in the bucket compared with the whopping \$740 million loss the firm posted in the previous quarter, observers say.

Wall Street had expected Apple to lose upwards of \$100 million for the quarter. Apple's sales, although 16% below figures for the same period last year, hovered around \$2.18 billion—the same point as the prior quarter.

Man with the plan

To restore Apple to profitability by the first half of next year, Apple Chairman and CEO Gilbert F. Amelio has taken some bold steps in the past six months. These include refusing on the Internet, reducing the number of models in the product line, reorganizing the business units, selling off expensive manufacturing plants and handing out more than 1,800 pink slips. Although

the moves haven't entirely stanch the financial bleeding, it has slowed down since last quarter, which was Apple's worst ever.

"I can sleep at night knowing it's OK to buy more Macs," said David Pensak, a senior research fellow and principal consultant for Advanced Computing Technology at Du Pont Co. in Wilmington, Del. "I'm pleased with what Amelio is trying to do. It's like pulling a Band-Aid off your arm. You can't do it slowly. You have to yank it off, Amelio did that last quarter, and the wound is healing."

Some financial analysts are also remaining high on Apple.

"It's not hard to be a \$9 billion company and be profitable. All you need to do is walk and chew gum at the same time," said David Wu, an analyst at The Chicago Group, a New York investment firm.

But others weren't as impressed. "While management seems to be doing a much better job of managing the business than has historically been the case, there was nothing in the results to suggest that longer term things are looking up," said Kori King, an analyst at Montgomery Securities in San Francisco.



CEO Gilbert F. Amelio kept Apple afloat, users say

NT 4.0

CONTINUED FROM PAGE 1

of NetWare, code-named Green River. That product is set to ship in September.

Leading credence to this theory was Microsoft's decision to ship a second postbeta version only one to two weeks after it sent out the initial release to 200 sites.

Uncommonly quick

Steve Milosevic, professional services technical manager at Syntex, Inc., a Microsoft and Novell platinum reseller, said Microsoft typically takes from 45 to 60 days between pre-release shipments. "Microsoft engineers can't possibly have responded or to fixed the bugs everyone reported," he said.

But Nash said Microsoft has put out Release Candidates this quickly before, and engineers are working daily to "fix any flaws" before NT 4.0 ships. "Many of the issues, such as the lack of documentation [on some technical issues], have already been corrected," he said.

Web sites

CONTINUED FROM PAGE 1

aches simply by being a site on the Web, said Judith Harwitz, president of Harwitz Group, Inc. in Newton, Mass. The push today is toward enhancing those sites with interactivity and more information to keep users coming back. "It's one thing to have technology available for people to play with but another thing for the technology to have a purpose and to do something real concrete," she said.

And do it

Check out some component-built sites:

- Virtual Vineyard, Web-based wine and gourmet food retailer: www.vineyard.com
- On Sale!, a virtual tour of Alchemy: www.on-sale.com
- Black Diamond Consulting, Inc., custom e-commerce: www.blackdiamond.com
- Investor's Edge, a virtual tour of Alchemy: www.investorsedge.com

On tap

Among the enticements for users are the following:

- Pumped-up pages could mean more money for firms that do business online.

Retailers, for instance, could track buyers' shopping habits and offer them information on retail items related to their interests when they log on to the store's site.

- In this medium, a wait of 20 seconds for a page to download often has most Web cruisers heading for another site, one developer said. Components slash wait-time and help retain astute readers by offering information on the same page instead of requiring addi-

ed," he said. That doesn't manage everyone's fears. Some users say they will delay deployment.

"We won't install NT Server 4.0 in a production environment until at least the first quarter [next year], after the first service pack has shipped," said Bob Lee, senior manager at Charles Schwab & Co., a discount brokerages in San Francisco.

Lee said he believes NT 4.0 is a quality product. But he said the brokerage will criticize it all the users say they were generally

Dispute the criticisms, all the users say they were generally

pleased with the level of functionality in the forthcoming Windows NT 4.0 and praised the inclusion of the Windows 95 user interface. Joe Olshak, an analyst at Forrester Research, Inc., said Microsoft is eager to ship NT 4.0 so it can shift its focus to the Internet.

"The bottom line is that the pressure is on Microsoft to address other issues—especially the Internet—and compete with Netscape," Olshak said.

OS/2 Warp Server gets the thumbs-up: See page 60.

Among the flaws found in Windows NT 4.0 betas

- Disparate naming schemes in dial-up boxes. Some have new Dial-up Networking; others have Remote Access Scripts.
- Inability of the automated install feature to prebuild scripts.
- Error messages that cause basic administration tools to crash.
- Security Access Module, which houses all user security accounts, experiences time-outs. This lengthens the log-in process.
- Problems installing Exchange Server.
- Memory violation error during installation of the graphical user interface, which has necessitated a hard reboot.

tional pages to be downloaded, the developer said.

- Animated ads are expected to attract more attention than static logos.

Patrick Connolly, a developer at Investors Edge, an online financial services provider in Mill Valley, Calif., is one of many observers who predict components will significantly change the way the Web looks and the way people interact with it. "The difference will be night and day," he said.

Components are already helping Web pages that use to sport flat text, logos and hypertext links turn up with drill-down database capabilities, user recognition and live information feeds.

"We have a screen that refers to an event in Africa called the Great Migration," said Greg Huthly, vice president of marketing and sales at Alpenglow, Inc., a CD-ROM and Internet page builder in Woodville, Wash.

"As you move your cursor over a series of thumbnail images, a larger image appears. You don't have to click. You don't have to leave this page for somewhere else, go through a download and whatever else," he explained.

Investors today can add such

features to Web pages without the help of components, but writing the necessary code is generally too expensive to justify.

With components, such as Microsoft Corp.'s ActiveX controls, JavaSoft's Java applets and IBM's assisted OpenDoc technology, developers are creating features such as the following:

- Three-dimensional images that rotate to give visitors a 360-degree view. Black Diamond Consulting, Inc. in Portsmouth, N.H., has created a component that real estate agents, for instance, could use to give potential home buyers a complete cyberview of a house's living room or neighborhood.
- Sites that have scrolling, live information feeds. Investor's Edge has switched from flat pages with a black background, a logo and hypertext links to pages that ascertains who you are when you hit the site. Using that information, Investor's Edge can scroll a live ticker of your stock portfolio across the top of the page while an ad scrolls across the bottom.

Some developers said they want to make sure the technology has a real business benefit.

Rob Renner, senior software developer at Virtual Vineyard, a Web-based wine and gourmet food retailer, said he is careful to avoid glitz and glitter that doesn't offer information. "You want to make things as easy as you can and as fast as you can... We don't want to have people wait to [buy] something," he said.

Primary colors

Federal Election Commission data shows that many high-tech executives supported Phil Gramm, Lamar Alexander, Steve Forbes and Pete Wilson before those candidates lost the GOP presidential primary race to Bob Dole. Sylvestre chairman Mark Hoffman backed Gramm in 1995, but when Gramm dropped out, Hoffman switched to Dole in 1996. Some contributions reflected a home-state bias. For example, the Texas-based executives from Electronic Data Systems and Compaq supported Gramm, a U.S. senator from Texas.

—Mick Beta

1995 to 1996 contribution

Phil Gramm	
Gary L. Fernandez (EDS)	\$3,000
Lester M. Albrecht Jr. (EDS)	\$2,000
Mark B. Hoffman (Sybase)	\$1,000
Richard Pfeiffer (Compaq)	\$1,000
T.J. Rodgers (Cypress Semiconductor)	\$1,000
Steve Dole	
Craig R. Benson (Cabletron)	\$3,000
S. Robert Levine (Cabletron)	\$3,000
Lawrence J. Ellison (Oracle)	\$1,000
Mark B. Hoffman (Sybase)	\$1,000



Source: Federal Election Commission

Pete Wilson	
Jerry Sanders (Advanced Micro Devices)	\$2,000
Leslie E. Platt (Hewlett-Packard)	\$1,000
Steve Forbes	
Scott G. McInelly (Sun)	\$1,000
Charles B. Wang (Computer Associates)	\$1,000



Lamar Alexander	
Edward R. McCracken (Silicon Graphics)	\$1,000
James L. Barksdale (Netscape)	\$500

altw

You can take an educational tour of Stonehenge, England's mysterious prehistoric monument, without ever leaving your chair. Users can visit a virtual reality model of Stonehenge at Intel's World Wide Web site (www.intel.com). Intel's goal is to show off its 166-MHz Pentium Pro processor, but the real wonder is how — and why — the stones were shaped, moved and erected about 4,000 years ago.



One size fits all



Wanna get a shirt like this?

Visit www.altw.com to see the shirt and to order it. The shirt is made of 100% cotton and is available in sizes S, M, L, and XL. The price is \$19.95 plus shipping and handling. The shirt is a great way to show off your love for the altw community.

No doubt sorry he asked...

"During yesterday's hearing on information warfare, you asked a rather indicate question: 'What does cyber mean, anyway?' reads a recent letter from CIA Director John Deutch to Sen. Sam Nunn (D-Ga.). Spymaster Deutch then went on to outline somewhat conflicting answers to the question, based on research by the CIA, the State Department and the Defense Department. According to one theory, 'cyber' comes from the Greek 'kybiste,' or 'diver,' from which we also derive the word 'cyberspace,' a genre of large dining berths. I hope this clears up any confusion." Deutch's letter concludes.

Netscape bug bites again

Internet creator The National Science Foundation (NSF) warns that people who access its site with Netscape 2.x browsers will get a security error. An NSF spokeswoman said the bug occurs every six months because that's when the foundation changes the certificate on its Netscape Commerce Server. Netscape browsers cache information from the previous certificate, which clashes with new certificate information and prompts the error. Users need to clear their cache to avoid the problem. The NSF spokeswoman said, Netscape has taken care of the problem with new versions of its browsers.

Sun revs Ultra line

Sun Microsystems this week will add a 200-MHz machine to its UltraSPARC-based Ultra line. Sun still will be "noticeably behind" vendors such as Digital Equipment and Hewlett-Packard on performance, one analyst said. But its pricing should be compelling enough to keep customers happy, the analyst said. Pricing for the new machine is expected to start somewhere under \$20,000.

On a mission from Temple, Texas

Texas Instruments executives hit the road last week to perform damage control after some recent reports that the notebook vendor was delivering somewhat buggy laptops and providing below-par support and service. The message from officials at the Dallas company is that service is being improved, manufacturing is being streamlined, and the company is keeping a closer eye on OEM partners.

Gates has left the building

Bill Gates' name is turning up on user conference agendas with the kind of regularity that one might associate with Wayne Newton and Las Vegas marquee. The Microsoft chairman will share the stage in Philadelphia with SAP AG founder Hans Flattner at SAP's North American Suppliers user conference that begins Aug. 25. From there, Gates will go on to New Orleans, where he's headlining — along with retired U.S. Gen. Colin Powell — at Computer Associates International's CA World users conference. The CA conference is being held that same week.

Ah, to be young again and, perchance, a Web page designer. The HP 3000 users' forum on the Internet last week carried lyrics for a parody of the Dire Straits song, "Money for Nothing." Called "Home Page for Nothing," it starts like this:

"Now look at them yepes, that's the way you do it. You write the code that runs the Web TV.
That ain't workin', that's the way you do it. Get yer home page for nothin' and your hits for free.

Now that ain't workin', that's the way you do it. Lemme tell ya, them gus can code.

Maybe get some backing Jore they even have a product. Maybe in a month they'll IPO.

If you have a song parody or news tip to share, plug out to news editor Patricia Keefe at (508) 820-8183 or via E-mail at patricia_keefe@arc.com.

THE
FOR \$**1497**, WE'LL TELL YOU

IS A **MINFIELD.**

THE MINES ARE.

As you work billions of lines of COBOL code and the
world are ready to detonate at the mere mention of
that date 2000, it's a big problem. Huge. The

Garfney Group projects businesses will

spend more than \$600 billion in the next 4 years trying

to fix it. But how can you do it for less? What's it
going to cost?

For a limited time, Cayenne offers Cayenne 2000

at a special price of just \$1497. That's it.

What it would cost to develop yours?

This expert advisor provides you with an exact

free diagnosis of your year 2000 problem alternative

paths through the minefield and the ability to size up the

cost of proceeding, before you start investing in consultants

and programmers. Cayenne 2000 even detects date dependencies across multiple

programs. It can correct many of the simpler problems and even reform

any fixes you make, so you don't check

them over again. It's the same procedure

networks use to check the format of a

file. Don't let them mess up your system

for more call 1-800-258-7294 or visit

us online at www.cayennesoft.com and start

your year 2000 fix.

SEARCH ALL
PROGRAMS BASED
ON EXTENSIBLE CRITERIA
INCLUDING:
File Structure
Data Structure
Redefining Data Structures
Cascades in Relational Tables
Data Elements in
WORKING-STORAGE
SS Level Fields

Cayenne

**TO ORDER
NOW CALL**

1-800-258-7294

OR VISIT

WWW.CAYENNESOFT.COM

There will be a \$50 shipping charge on returned product.
Cayenne Software and Cayenne are trademarks, and Business
is a registered trademark of Sachson Information Systems, Inc.
Cable Technologies, Inc. and Cable are registered trademarks of
Cable Technologies, Inc. Completion of the register is subject to
regulatory and corporate approvals.

CW



We're talking about
Seer+HPS, easy-to-use tools
that let you be more efficient,
effective, and productive.

They've already proven
themselves at companies like

Union Credit, TeleDanmark,
Federated Department Stores,
Sikorsky Aircraft, EDS and
Comrail, on applications built
by anywhere from one to 800
developers, supporting from

just a few dozen all the way
up to millions of end users.

Seer+HPS, tools that fit
your size. If you'd like to find
out more about
the application

these companies have up and
running right now, or about
how Seer can help you, call
1-800-499-SEER or visit us
on the Internet at

SEER

We've been there.

<http://www.seer.com>